# ASUS® Terminator 2

## Barebone System
## Model T2-R

# User Guide

**E1431**

**First Edition V1**

**December 2003**

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# Table of contents


Notices ..... 6
Safety information ..... 7
About this guide ..... 8
System package contents ..... 10

**Chapter 1: System introduction**

1.1 Welcome! ..... 12
1.2 Front panel ..... 12
1.3 Rear panel ..... 14
1.4 Internal components ..... 16

**Chapter 2: Basic installation**

2.1 Preparation ..... 18
2.2 Before you proceed ..... 18
2.3 Removing the cover ..... 19
2.4 Removing the power supply ..... 20
2.5 Installing a CPU ..... 21
2.5.1 Removing the CPU fan and heatsink assembly .... 21
2.5.2 CPU installation ..... 22
2.5.3 Re-installing the CPU fan and heatsink assembly .. 23
2.6 Installing a DIMM ..... 24
2.6.1 Memory configurations ..... 24
2.6.2 DIMM installation ..... 25
2.7 Installing an expansion card ..... 26
2.7.1 Expansion slots ..... 26
2.7.2 Expansion card installation ..... 27
2.7.3 Configuring an expansion card ..... 28
2.8 Installing a second optical drive ..... 29
2.9 Installing a hard disk drive ..... 31
2.10 Re-installing the power supply unit ..... 33
2.10.1 Voltage selector ..... 34
2.10.2 Power supply specifications ..... 35
2.11 Replacing the cover ..... 36
2.12 Connecting external devices ..... 37

# Table of contents

## Chapter 3: Starting up


3.1 Installing an operating system ..... 40
3.2 Powering up ..... 40
3.3 Support CD information ..... 40
3.3.1 Running the support CD ..... 41
3.3.2 Drivers menu ..... 41
3.3.3 Utilities ..... 42
3.3.4 ASUS contact information ..... 43
3.3.5 Other information ..... 43
3.4 Software information ..... 44
3.4.1 Multi-channel audio feature ..... 44
3.4.2 ASUS Instant Music ..... 47


## Chapter 4: Motherboard info


4.1 Introduction ..... 50
4.2 Motherboard layout ..... 50
4.3 Jumper ..... 51
4.4 Connectors ..... 52


## Chapter 5: BIOS setup


5.1 Managing and updating your BIOS ..... 60
5.1.1 Creating a bootable floppy disk ..... 60
5.1.2 Using AFUDOS to copy the current BIOS ..... 61
5.1.3 Using AFUDOS to update the BIOS ..... 62
5.1.4 Using ASUS EZ Flash to update the BIOS ..... 64
5.1.5 Recovering the BIOS with CrashFree BIOS 2 ..... 65
5.1.6 ASUS Update ..... 67
5.2 BIOS Setup program ..... 69
5.2.1 BIOS menu screen ..... 70
5.2.2 Menu bar ..... 70
5.2.3 Navigation keys ..... 70
5.2.4 Menu items ..... 71
5.2.5 Sub-menu items ..... 71
5.2.6 Configuration fields ..... 71

# Table of contents


5.2.7 Pop-up window ..... 71
5.2.8 Scroll bar ..... 71
5.2.9 General help ..... 71
5.3 Main menu ..... 72
5.3.1 System Time ..... 72
5.3.2 System Date ..... 72
5.3.3 Legacy Diskette A ..... 72
5.3.4 Primary and Secondary IDE Master/Slave ..... 73
5.3.5 System Information ..... 74
5.4 Advanced menu ..... 75
5.4.1 Instant Music Configuration ..... 76
5.4.2 CPU Configuration ..... 77
5.4.3 Chipset ..... 77
5.4.4 Onboard Devices Configuration ..... 80
5.4.5 PCI PnP ..... 81
5.5 Power menu ..... 83
5.5.1 Suspend Mode ..... 83
5.5.2 Repost Video on S3 Resume ..... 83
5.5.3 ACPI 2.0 Support ..... 83
5.5.4 ACPI APIC Support ..... 83
5.5.5 APM Configuration ..... 84
5.5.6 Hardware Monitor ..... 85
5.6 Boot menu ..... 87
5.6.1 Boot Device Priority ..... 87
5.6.2 Boot Settings Configuration ..... 88
5.6.3 Security ..... 89
5.7 Exit menu ..... 92

# Notices

## Federal Communications Commission Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

**WARNING!** The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

## Canadian Department of Communications Statement

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

**This class B digital apparatus complies with Canadian ICES-003.**

# Safety information

## Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

## Operation safety

- Before installing devices into the system, carefully read all the documentation that came with the package.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet. Place the product on a stable surface.
- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

**Lithium-Ion Battery Warning**

**CAUTION**: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturerís instructions.

**VORSICHT**: Explosionsgetahr bei unsachgemäßen Austausch der Batterie. Ersatz nur durch denselben oder einem vom Hersteller empfohlenem  ähnljchen Typ. Entsorgung gebrauchter Batterien nach Angaben des Herstellers.

**LASER PRODUCT WARNING**

**CLASS 1 LASER PRODUCT**

# About this guide

## Audience

This guide provides general information and installation instructions about the ASUS Terminator 2 barebone system. This guide is intended for experienced users and integrators with hardware knowledge of personal computers.

## How this guide is organized

This guide contains the following parts:

1. **Chapter 1: System introduction**

   This chapter gives a general description of the ASUS Terminator 2. The chapter lists the system features including introduction on the front and rear panel, and internal components.

2. **Chapter 2: Basic installation**

   This chapter provides step-by-step instructions on how to install components in the system.

3. **Chapter 3: Starting up**

   This chapter helps you power up the system and install drivers and utilities from the support CD.

4. **Chapter 4: Motherboard information**

   This chapter gives information about the motherboard that comes with the system. This chapter includes the motherboard layout, jumper settings, and connector locations.

5. **Chapter 5: BIOS setup**

   This chapter tells how to change system settings through the BIOS Setup menus and describes the BIOS parameters.

6. **Appendix**

   The Appendix includes the power supply unit specification and IEEE 802.11b channels for the wireless LAN adapter.

## Conventions used in this guide

**WARNING:** Information to prevent injury to yourself when trying to complete a task.

**CAUTION:** Information to prevent damage to the components when trying to complete a task.

**IMPORTANT:** Information that you MUST follow to complete a task.

**NOTE:** Tips and additional information to aid in completing a task.

## Where to find more information

Refer to the following sources for additional information and for product and software updates.

1. **ASUS Websites**

   The ASUS websites worldwide provide updated information on ASUS hardware and software products. Refer to the ASUS contact information.

2. **Optional Documentation**

   Your product package may include optional documentation, such as warranty flyers, that may have been added by your dealer. These documents are not part of the standard package.

# System package contents

Check your ASUS Terminator 2 package for the following items:

1. **ASUS Terminator 2 barebone system with:**
   - ASUS P4R8T motherboard
   - Floppy disk drive
   - Optical drive (optional)*
   - Modem (optional)
2. **Power cable and plug**
3. **Support CD**
4. **User guide**

* *CD-ROM/CD-RW/DVD-ROM/DVD-RW*

If any of the items is damaged or missing, contact your retailer immediately.

# Chapter 1

# System introduction

This chapter gives a general description of the ASUS Terminator 2. The chapter lists the system features including introduction on the front and rear panel, and internal components.

**ASUS Terminator 2 barebone system**

# 1.1 Welcome!

Thank you for choosing the ASUS Terminator 2!

The ASUS Terminator 2 is an all-in-one barebone system with a versatile home entertainment feature.

The system comes in a stylish mini-tower casing, and powered by the ASUS P4R8T motherboard that supports Intel® Pentium® 4 Northwood/Prescott processor with an 800MHz FSB, and up to 2GB system memory.

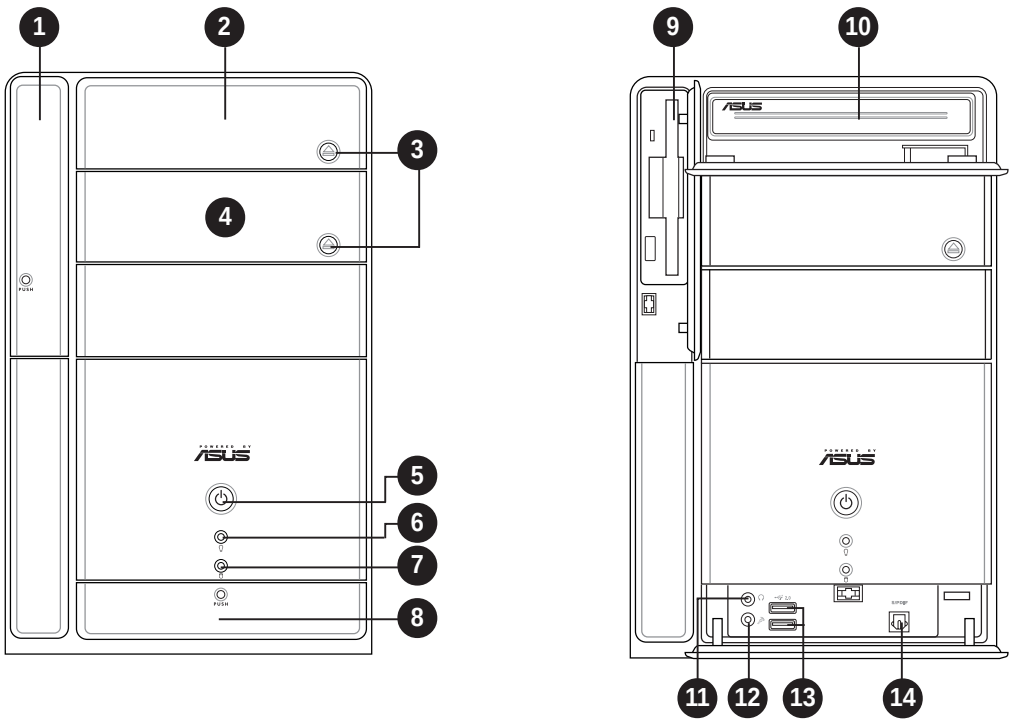
With unmatched video and audio capabilities, Fast Ethernet, and extensive connectivity, Terminator 2 is designed for the sophisticated.

With these and many more, the Terminator 2 definitely delivers the cutting edge technology for your computing and multimedia needs!

# 1.2 Front panel

The front panel includes the system and audio control buttons, system LEDs, and LED panel.

**External** **Internal**




1. **Floppy drive door.** Open this door to access the floppy disk drive.
2. **Optical drive door.** This door opens when you eject the loading tray.

3. **Eject button.** Press this button to eject the loading tray of the optical drive.
4. **Second optical drive door.** This door covers a second optical drive bay.
5. **Power button.** Press this button to turn the system on.
6. **Power LED.** When lit, this LED indicates that the system is ON.
7. **HDD LED.** This LED lights up when data is being read from or written to the hard disk drive
8. **Front panel I/O door.** Open this door to show the front panel input/output ports.

The optical drive(s) and several I/O ports are located inside the front panel doors. Open the front panel doors by pressing the

mark.

9. **Floppy disk drive.** This drive is for 1.44MB, 3.5-inch floppy disk.
10. **Optical drive.** This is an IDE optical drive.
11. **Headphone port.** This port connects a headphone with a stereo mini-plug.
12. **Microphone port.** This Mic (pink) port connects a microphone.

**Audio ports function variation**

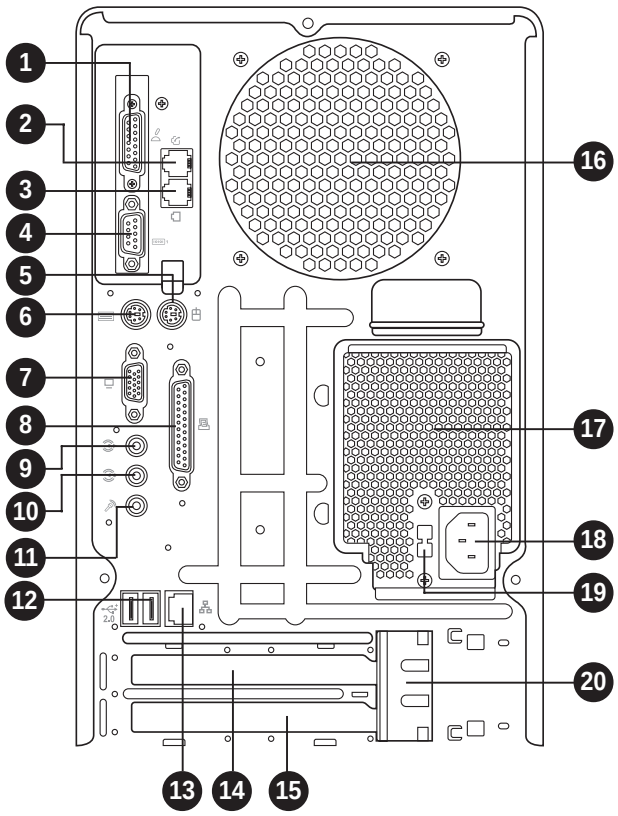
| Port | Headphone/2-Channel | 4-Channel | 6-Channel |
|---|---|---|---|
| Light Blue | Line In | No function | LFE Output*/Center |
| Lime | Line Out | Front Speaker Out | Front Speaker Out |
| Pink | Mic In | Surround | Surround |

** Low Frequency Enhanced Output*

13. **USB 2.0 ports.** These Universal Serial Bus 2.0 (USB 2.0) ports are available for connecting USB 2.0 devices such as a mouse, printer, scanner, camera, PDA, and others.
14. **Optical S/PDIF port.** This port connects your audio system for 5.1-channel surround sound and enhanced 3D audio.

# 1.3 Rear panel

The system rear panel includes the power socket and several I/O ports that allow convenient connection of devices.

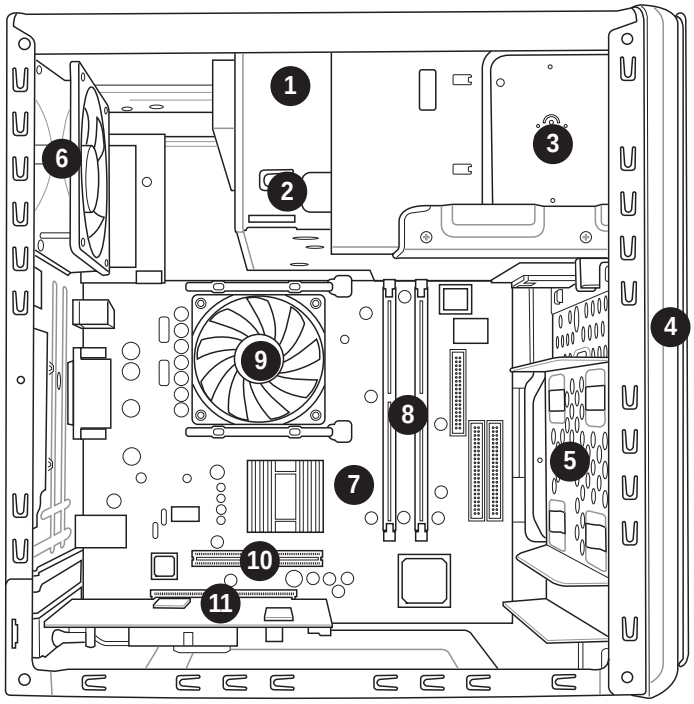



1. **GAME/MIDI port.** This port connects a joystick, or game pad for playing games, and MIDI devices for audio editing.
2. **Telephone port** *(optional)***.** This port connects an RJ-11 cable jack. Connect one end of an RJ-11 cable to this port and the other end to the RJ-11 port of the telephone unit.
3. **RJ-11 port** *(optional)***.** This port connects an RJ-11 cable jack. Connect one end of an RJ-11 cable to this port and the other end to the RJ-11 wall socket.
4. **Serial port.** This port connects a mouse, modem, or other devices that conforms with serial specification.
5. **PS/2 mouse port.** This green 6-pin connector is for a PS/2 mouse.
6. **PS/2 keyboard port.** This purple 6-pin connector is for a PS/2 keyboard.
7. **VGA port.** This port connects a VGA monitor.
8. **Parallel port.** This 25-pin port connects a printer, scanner, or other devices.

9. **Line Out port.** This Line Out (lime) port connects a headphone or a speaker. In 4/6-channel mode, the function of this port becomes Front Speaker Out.
10. **Line In port.** This Line In (light blue) port connects a tape player or other audio sources. In 6-channel mode, the function of this port becomes Low Frequency Enhanced Output/Center.
11. **Microphone port.** This Microphone (pink) port connects a microphone. In 4/6-channel mode, the function of this port becomes Surround Speaker.
12. **USB 2.0 ports.** These Universal Serial Bus 2.0 (USB 2.0) ports are available for connecting USB 2.0 devices such as a mouse, printer, scanner, camera, PDA, and others.
13. **Ethernet LAN port.** This port allows connection to a Local Area Network (LAN) through a network hub.
14. **AGP slot cover**. Remove this cover when installing an AGP card.
15. **PCI slot cover**. Remove this cover when installing an AGP card.
16. **Chassis fan.** This fan provides ventilation inside the system chassis.
17. **Power supply unit fan.** This fan provides ventilation inside the power supply unit.
18. **Power socket.** This socket connects the power cable and plug.
19. **Voltage selector.** This switch allows you to select the appropriate voltage supply in your area. See the “Voltage selector” section on page 34 before adjusting this switch.
20. **Expansion card lock.** This metal lock secures installed expansion cards. See page 27 for details.

# 1.4 Internal components

The illustration below is the internal view of the system when you remove the top cover and the power supply unit. The installed components are labeled for your reference. Proceed to Chapter 2 for instructions on installing other system components.




1. Optical drive
2. 5.25-inch empty optical drive bay
3. Floppy disk drive
4. Front panel cover
5. Hard disk drive metal tray
6. Chassis fan
7. ASUS P4R8T motherboard
8. DIMM sockets
9. CPU fan and heatsink assembly
10. AGP slot
11. PCI slot (with an installed PCI card)

# Chapter 2

# Basic installation

This chapter provides step-by-step instructions on how to install components in the system.

**ASUS Terminator 2 barebone system**

# 2.1 Preparation

Before you proceed, make sure that you have all the components that you plan to install in the system.

## Basic components to install

1. Central processing unit (CPU)
2. DDR Dual Inline Memory Module (DIMM)
3. Expansion card(s)
4. Hard disk drive
5. Second optical drive

## Tool

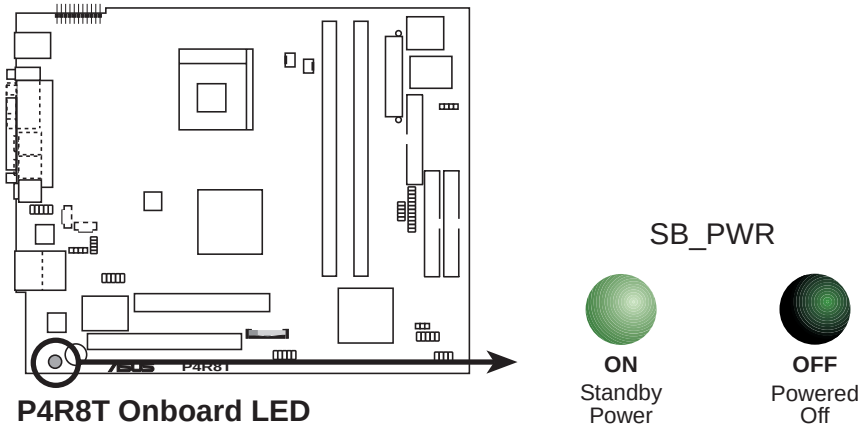
Phillips (cross) screw driver

# 2.2 Before you proceed

Take note of the following precautions before you install components into the system.

1. Use a grounded wrist strap or touch a safely grounded object or to a metal object, such as the power supply case, before handling components to avoid damaging them due to static electricity.
2. Hold components by the edges to avoid touching the ICs on them.
3. Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.

The motherboard comes with an onboard standby power LED. When lit, this LED indicates that the system is ON, in sleep mode or in soft-off mode, and not powered OFF. Unplug the power cable from the power outlet and make sure that the standby power LED is OFF before installing any system component.

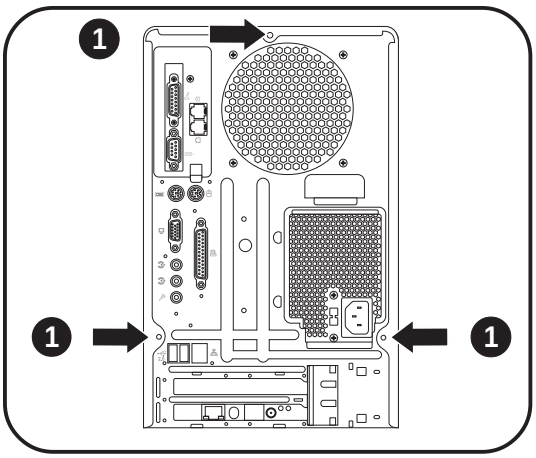



**P4R8T Onboard LED**

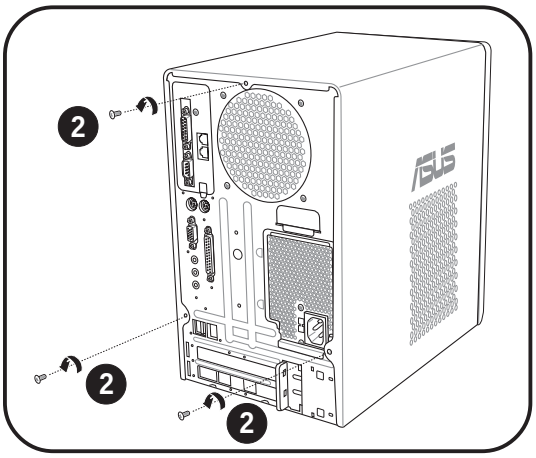
# 2.3 Removing the cover

To remove the cover:

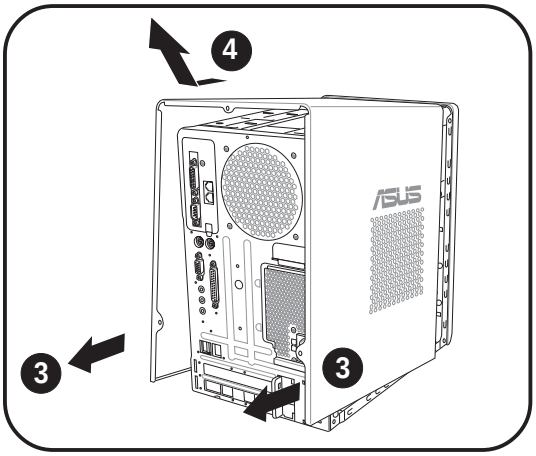
1. On the rear panel, locate the three screws that secure the cover to the chassis.




2. Use a Phillips (cross) screw driver to remove the cover screws. Keep the screws for later use.




3. Pull the cover slightly toward the rear panel until the side tabs are disengaged from the chassis.
4. Lift the cover, then set aside.

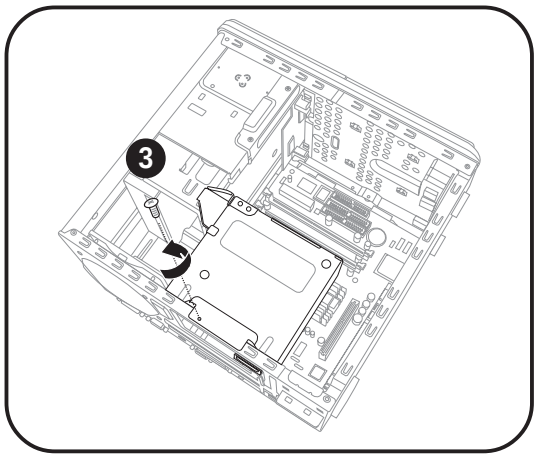


# 2.4 Removing the power supply

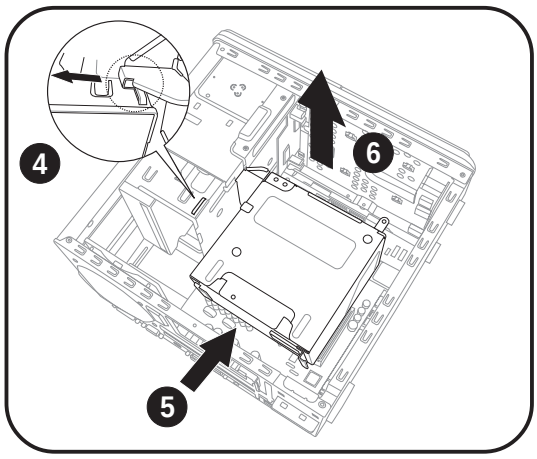
You must remove the power supply unit (PSU) before you can install a central processing unit (CPU) and other system components. See page 33-35 for details on the PSU.

To remove the PSU:

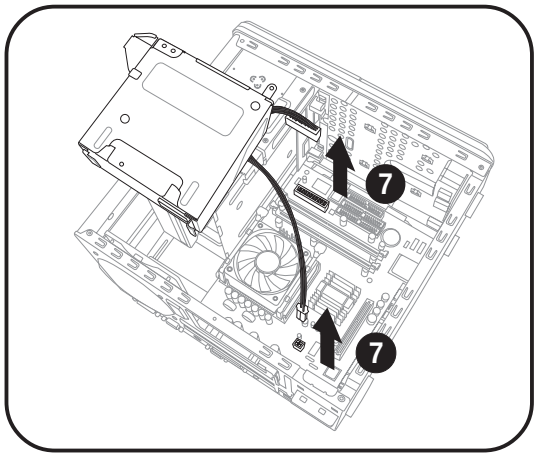
1. Lay the system on its side on a flat, stable surface.
2. Disconnect all power plugs from the optical drive and floppy disk drive.
3. Remove the screw that secures the PSU to the chassis.




4. Slide the PSU to the left until the side hook is disengaged from the chassis.
5. Push the PSU towards the front panel for about half an inch.
6. Slightly lift the PSU.




7. Disconnect the power plugs from the motherboard.
8. Set the PSU aside.




When removing the PSU, make sure to hold or support it firmly. The unit may accidentally drop and damage other system components.

# 2.5 Installing a CPU

The P4R8T motherboard comes with a surface mount 478-pin Zero Insertion Force (ZIF) socket. This socket is specifically designed for Intel® Pentium® 4 Northwood/Prescott processor.

## 2.5.1 Removing the CPU fan and heatsink assembly

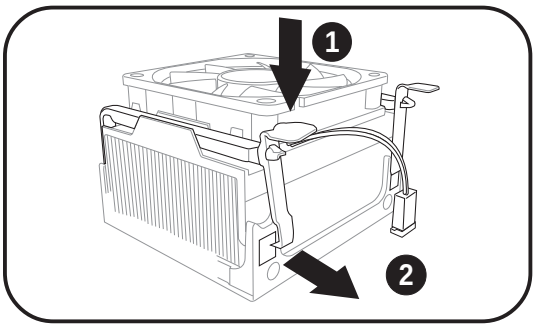
The system package includes a pre-installed proprietary CPU fan and heatsink assembly to ensure optimum thermal condition and performance.

**DO NOT** replace the proprietary CPU fan and heatsink with other models.

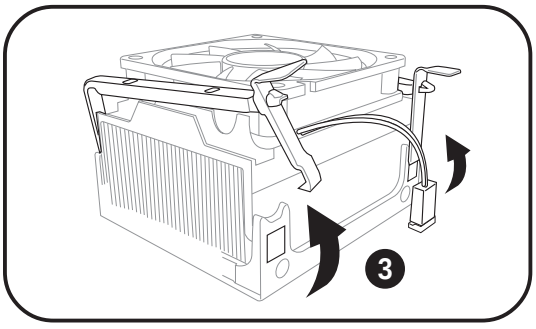
You must remove the CPU fan and heatsink assembly before you can install a CPU.

To remove the CPU fan and heatsink assembly:

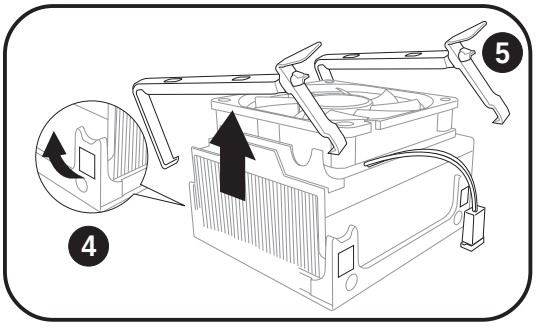
1. Carefully press down the locking lever of the retention bracket
2. Detach the retention bracket hook from the retention module hole by flipping the locking lever to the direction of the arrow.



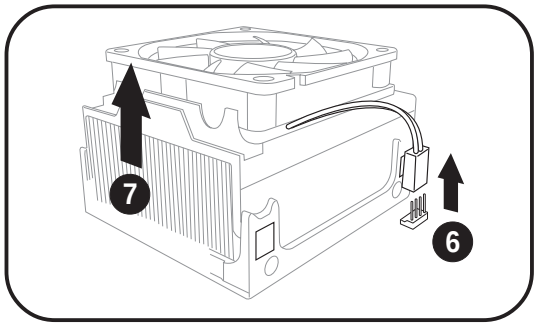

3. Slightly lift the retention bracket.




4. Detach the other retention bracket hook from the hole on the other side of the retention module, then lift.
5. Do steps 1-4 to remove the second retention bracket.



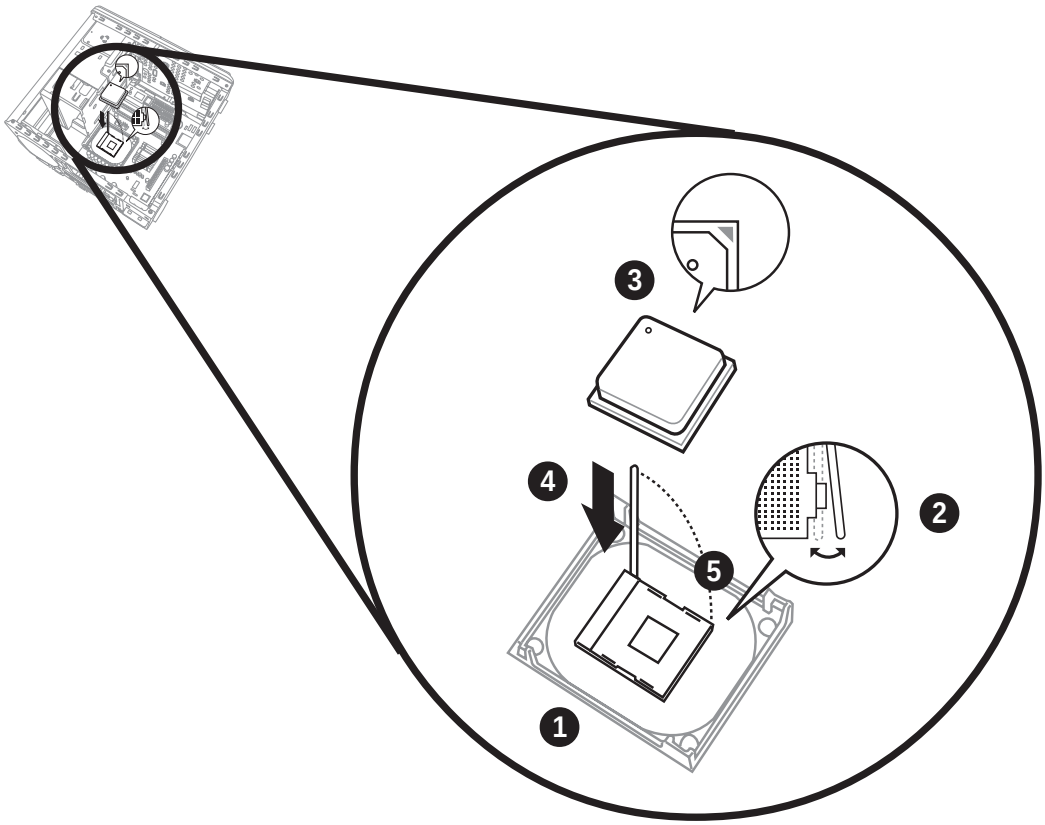
6. Disconnect the CPU fan cable from the CPU fan connector on the motherboard.
7. Lift the CPU fan and heatsink assembly, then set aside.




## 2.5.2 CPU installation

To install the CPU:

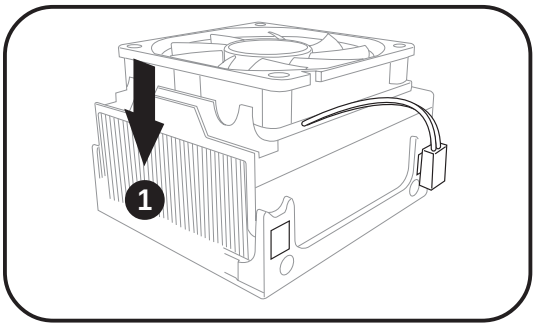
1. Locate the 478-pin CPU socket on the motherboard.
2. Unlock the socket by pressing the lever sideways then lifting it up to a 90° angle.
3. Position the CPU above the socket such that its marked corner (gold mark) matches the base of the socket lever.
4. Carefully insert the CPU into the socket until it fits in place.
5. Push down the socket lever to secure the CPU. The lever clicks on the side tab to indicate that it is locked.



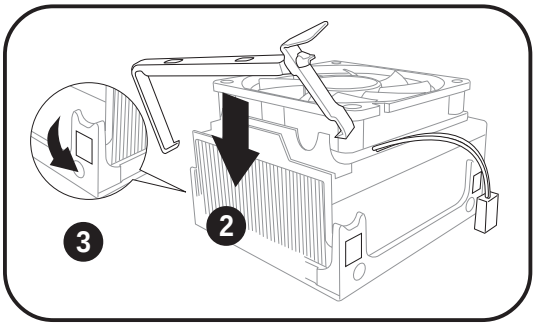
## 2.5.3 Re-installing the CPU fan and heatsink assembly

To re-install the CPU fan and heatsink assembly:

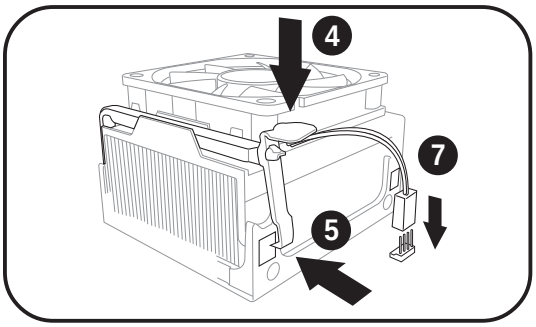
1. Position the CPU fan and heatsink assembly on top of the installed CPU.




2. Align the retention bracket with the rails on the side of the CPU fan.
3. Attach the retention bracket hook to the retention module hole.




4. Carefully press down the locking lever on the other side of the retention bracket.
5. Attach the locking lever hook to the retention module hole to secure the fan and heatsink assembly in place.
6. Follow steps 2 to 5 to re-install the second retention bracket.
7. Connect the CPU fan cable to the CPU fan connector on the motherboard.



# 2.6 Installing a DIMM

The motherboard comes with two Double Data Rate (DDR) Dual Inline Memory Module (DIMM) sockets. These sockets support up to 2GB system memory using unbuffered non-ECC PC3200/2700/2100 DIMMs.

## 2.6.1 Memory configurations

You may install 64MB, 128MB, 256MB, 512MB, and 1GB DDR DIMMs into the DIMM sockets.

Obtain DDR DIMMs only from ASUS qualified vendors. Refer to the table below. Visit the ASUS website (www.asus.com) for the latest Qualified Vendors List.

### Qualified DDR400 vendors list

This table lists the memory modules that have been tested and qualified for use with this motherboard.

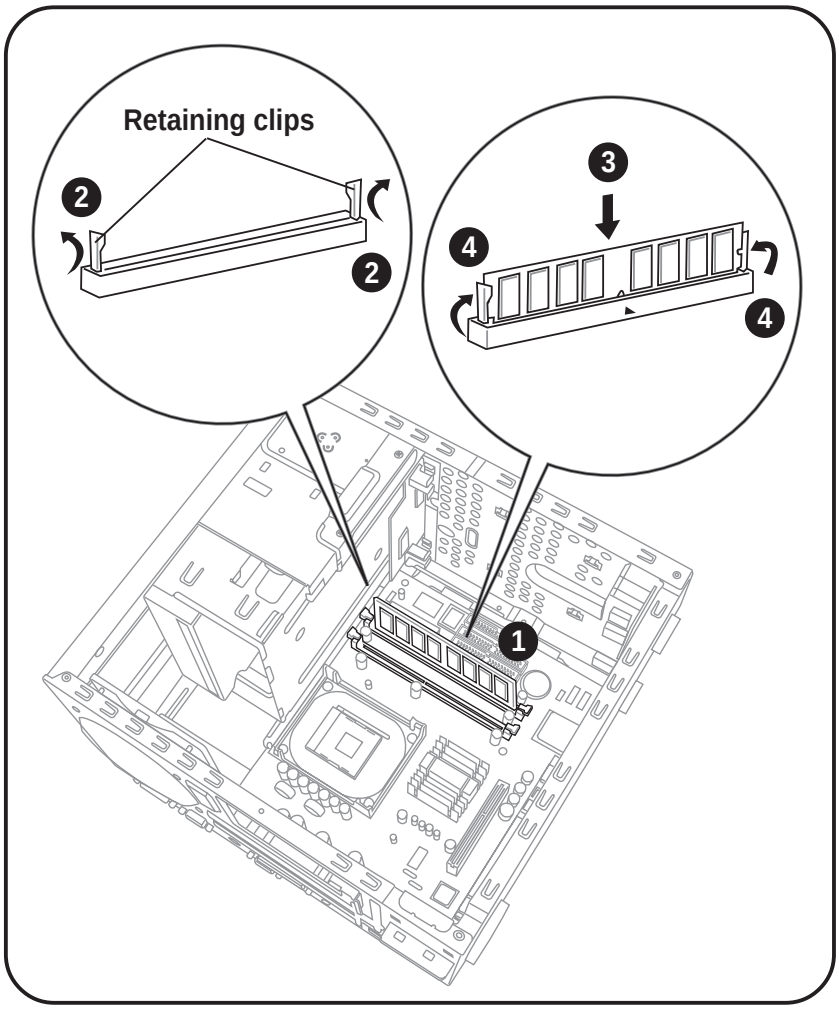
| Size | Vendor | Part Number | Chip Brand | Chip Number |
|---|---|---|---|---|
| 256MB | MICRON | MT8VDDT3264AG-40BC4 | MICRON | 46V32M8 |
| 256MB | PSC | AL5D8B53T-5B1K | PSC | A2S56D30BTP |
| 256MB | TwinMOS | M2G9108AIATT9F081AADT | TwinMOS | TMD7608F8E50D |
| 256MB | SAMSUNG | M368L3223DTM-CC4 | SAMSUNG | K4H560838D-TCC4 |
| 256MB | SAMSUNG | M368L3223DTM-CCC | SAMSUNG | K4H560838D-TCCC |
| 256MB | Kingston | KVR400X64C25/256 | Winbond | W9425088H-5 |
| 256MB | Transcend | TS32MLD64V4F3 | MOSEL | V58C2256804SAT5 |
| 256MB | CORSAIR | CMX256A-3500C2PT | — | — |
| 256MB | Infineon | HYS64D32300GU-5-B | Infineon | HYB25D256800BT-5 |

- Install only **identical** (the same type and size) DDR DIMM in DIMM_A and DIMM_B.
- Always install DIMMs with the same CAS latency. For optimum compatibility, it is recommended that you obtain memory modules from the same vendor.
- This motherboard only supports x4, x8, x16 chips/per module DDR DIMMs.

## 2.6.2 DIMM installation

To install a DDR DIMM.

1. Locate the two DIMM sockets on the motherboard.
2. Unlock a socket by pressing the retaining clips outward.
3. Align a DIMM on the socket such that the notch on the DIMM matches the break on the socket.
4. Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.




A DDR DIMM is keyed with a notch so that it fits in only one direction. DO NOT force a DIMM into a socket to avoid damaging the DIMM!

# 2.7 Installing an expansion card

In the future, you may need to install expansion cards. The motherboard has one PCI and one Accelerated Graphics Port (AGP) slot. The following sub-sections describe the slots and the expansion cards that they support.

## 2.7.1 Expansion slots

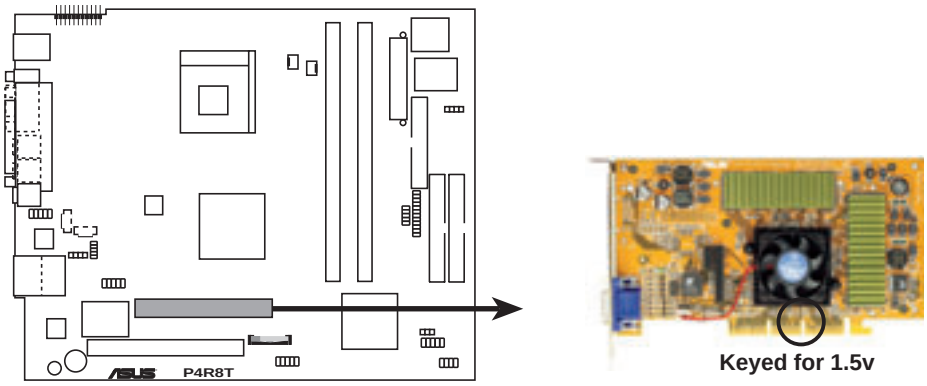
### PCI slot

The PCI slot supports PCI cards such as a LAN card, SCSI card, USB card, and other cards that comply with PCI specifications.

### AGP slot

The AGP slot supports AGP 8X/4X cards. When you buy an AGP card, make sure that you ask for one with +1.5V specification.

Install only +1.5V AGP cards. The P4R8T motherboard does not support 3.3V AGP cards.




**P4R8T Accelerated Graphics Port (AGP)**

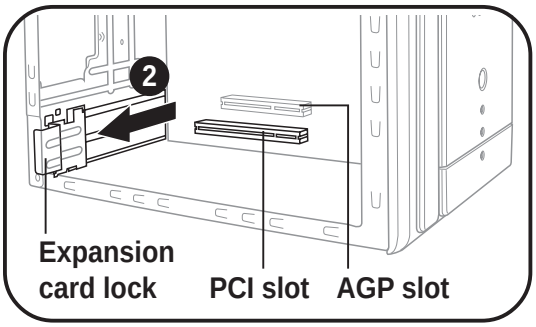
Make sure to unplug the power cord before adding or removing expansion cards. Failure to do so may cause you physical injury and damage the motherboard.

## 2.7.2 Expansion card installation

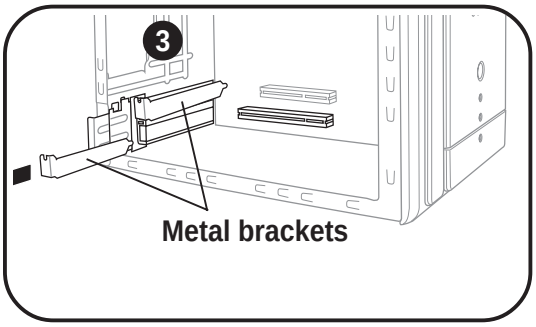
To install an expansion card.

1. Before installing the expansion card, read the documentation that came with it and make the necessary hardware settings for the card.

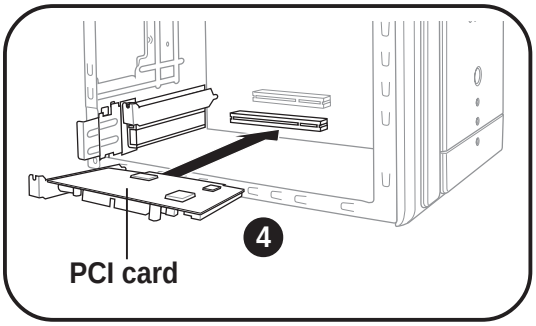
2. Pull the expansion card lock to the direction of the arrow.



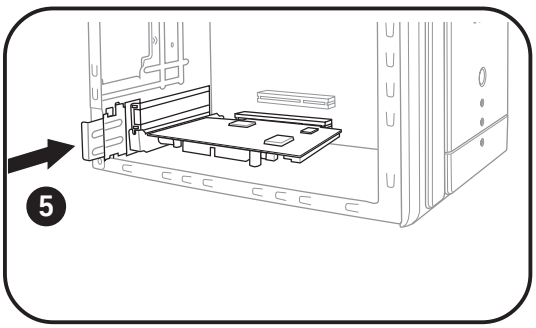

3. Remove the metal bracket opposite the slot that you intend to use.




4. Align the card connector with the slot and press firmly until the card is completely seated on the slot.




5. Replace the expansion card lock to secure the card to the chassis.



## 2.7.3 Configuring an expansion card

After installing the expansion card, configure it by adjusting the software settings.

1. Turn on the system and change the necessary BIOS settings, if any. See Chapter 5 for information on the BIOS setup.
2. Assign an IRQ to the card. Refer to the tables on the next page.
3. Install the software drivers for the expansion card.

### Standard interrupt assignments

| IRQ | Priority | Standard Function |
|---|---|---|
| 0 | 1 | System Timer |
| 1 | 2 | Keyboard Controller |
| 2 | N/A | Programmable Interrupt |
| 3* | 11 | Communications Port (COM2) |
| 4* | 12 | Communications Port (COM1) |
| 5* | 13 | Sound Card (sometimes LPT2) |
| 6 | 14 | Floppy Disk Controller |
| 7* | 15 | Printer Port (LPT1) |
| 8 | 3 | System CMOS/Real Time Clock |
| 9* | 4 | ACPI Mode when used |
| 10* | 5 | IRQ Holder for PCI Steering |
| 11* | 6 | IRQ Holder for PCI Steering |
| 12* | 7 | PS/2 Compatible Mouse Port |
| 13 | 8 | Numeric Data Processor |
| 14* | 9 | Primary IDE Channel |
| 15* | 10 | Secondary IDE Channel |

* These IRQs are usually available for ISA or PCI devices.

### IRQ assignments for this motherboard

| | A | B | C | D |
|---|---|---|---|---|
| PCI slot 1 | -- | -- | **shared** | -- |
| AGP slot | **used** | -- | -- | -- |
| Onboard USB controller HC0 | -- | -- | -- | **shared** |
| Onboard USB controller HC1 | -- | -- | -- | **shared** |
| Onboard USB 2.0 controller | -- | -- | -- | **shared** |
| Onboard LAN | -- | -- | **shared** | -- |
| Onboard Audio | -- | **used** | -- | -- |

When using a PCI card on shared slots, ensure that the drivers support "Share IRQ" or that the cards do not need IRQ assignments. Otherwise, conflicts will arise between the two PCI groups, making the system unstable and the card inoperable.

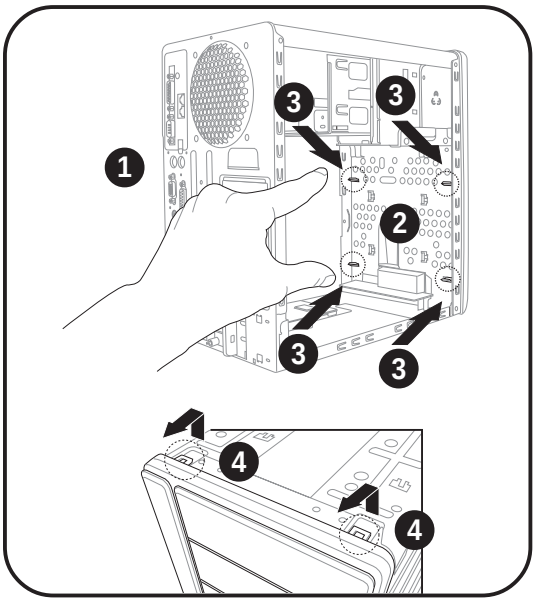
# 2.8 Installing a second optical drive

The system comes with a pre-installed optical drive (DVD-RW, DVD-ROM, CD-RW, or CD-ROM) and an empty 5.25-inch drive bay for a second optical drive.

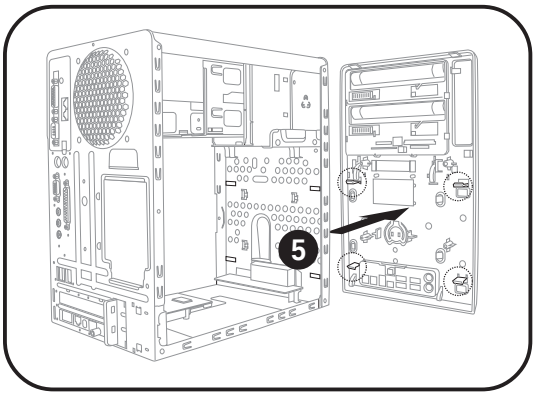
Set your second optical drive as Slave device before connecting the IDE cable and power plug. Refer to the optical drive documentation on how to set the drive as a Slave device.

To install a second optical drive:

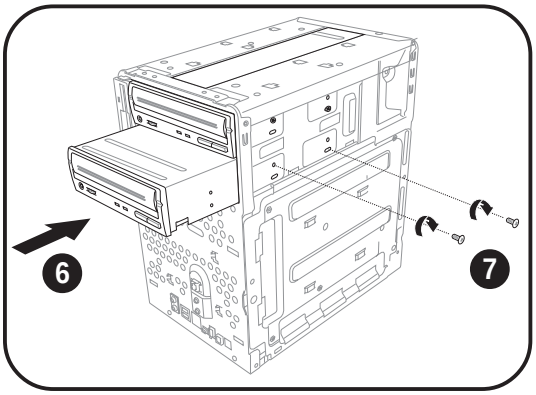
1. Place the chassis upright.
2. Locate the front panel cover hooks.
3. Press the hooks inward to release the front panel cover from the chassis.
4. Detach the front panel cover top hooks.



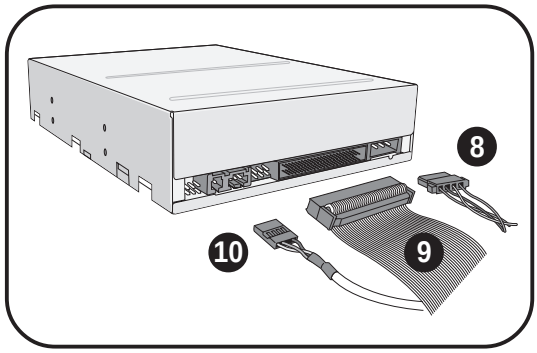

5. Push the the front panel cover slightly outwards to detach it from the chassis, then set it aside.




6. Carefully push the optical drive to the bay until its screw holes are aligned with the holes on the bay. Refer to the illustration.
7. Secure the optical drive with two screws on one side of the bay.



8. Connect a power plug from the power supply unit to the power connector at the back of the optical drive.



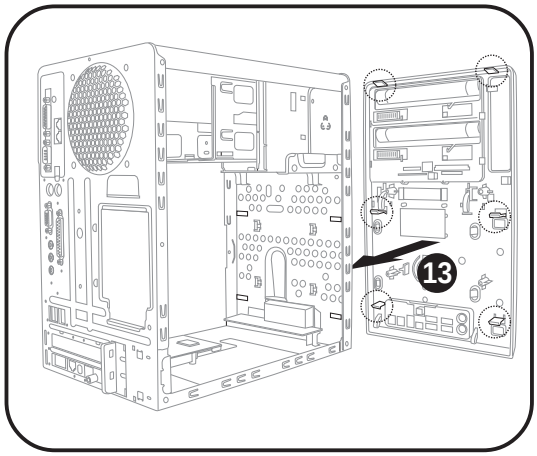

9. Connect one end of the IDE ribbon cable to the IDE interface at the back of the optical drive, matching the red stripe on the cable with Pin 1 on the IDE interface.

10. Connect one end of the optical drive audio cable to the 4-pin connector at the back of the optical drive.

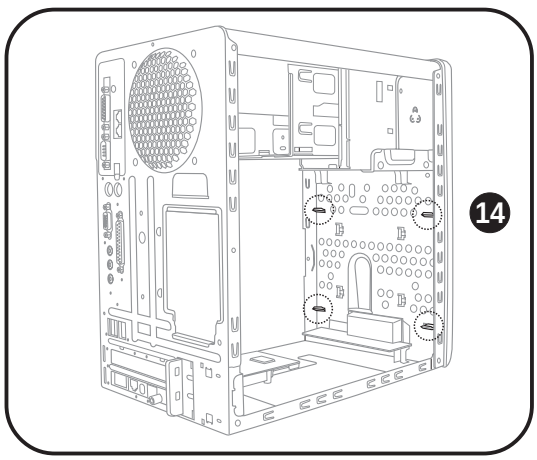
11. Connect the other end of the IDE ribbon cable to the secondary IDE connector (black connector labeled SEC_IDE) on the motherboard. See page 53 for the location of the secondary IDE connector.

12. Connect the other end of the audio cable to the black 4-pin connector labeled CD1 on the motherboard. See page 53 for the location of the CD connector.

13. Re-install the front panel cover by aligning its hooks with the holes on the chassis.




14. Snap the front panel cover hooks to the chassis holes as indicated.

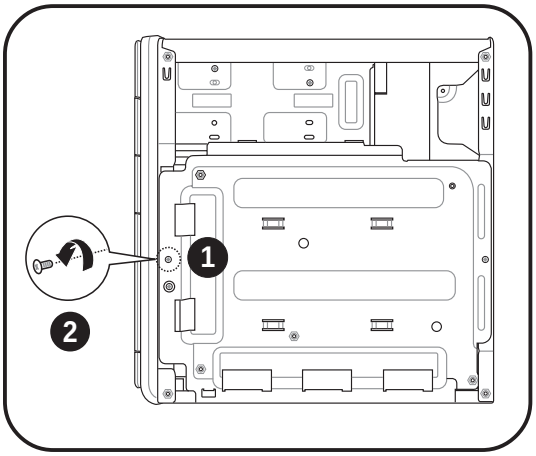


# 2.9 Installing a hard disk drive

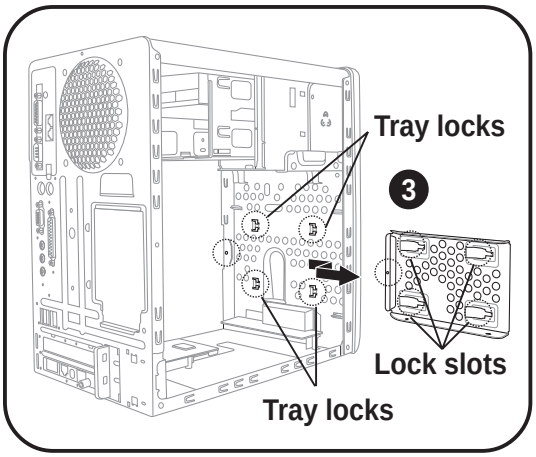
The system supports one UltraATA133 IDE hard disk drive (HDD).

To install a hard disk drive:

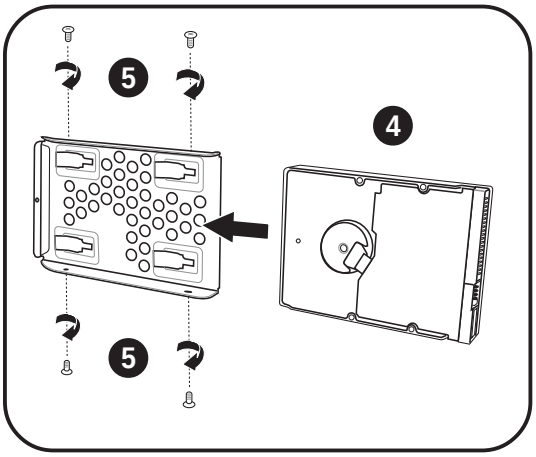
1. Locate the HDD metal tray flathead lock screw on the other side of the chassis.
2. Remove the flat head screw using a Philips screw driver. Keep the screw for later use.




3. Slide the HDD metal tray outward until its slots are released from the tray locks.

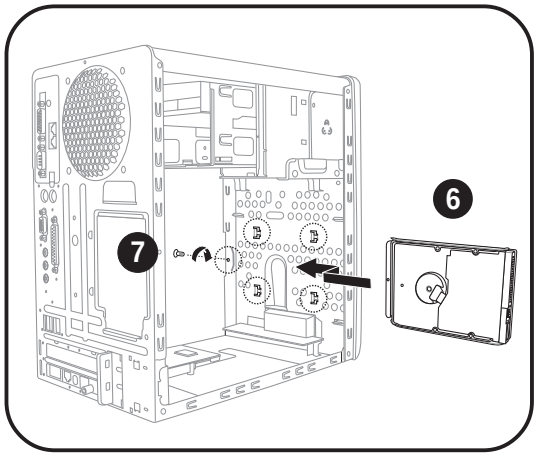



4. Place a hard disk drive on the metal tray with its bottom on the open side of the tray. Align the HDD and metal tray screw holes.
5. Secure the HDD with four screws.

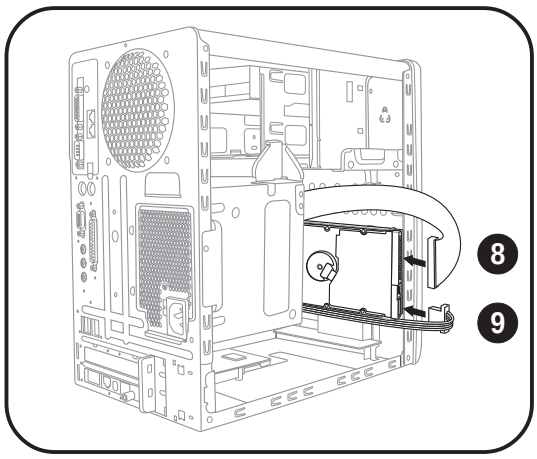



Configure your hard disk drive as Master device before connecting the IDE cable and power plug. Refer to the HDD documentation on how to set the drive as Master device.

6. Re-install the metal tray and the HDD by sliding it to the tray hooks.
7. Secure the HDD metal tray with the flat head screw you earlier removed.




8. Connect one end of the 40-pin IDE cable to the IDE connector on the drive.
9. Connect a 4-pin power plug from the power supply unit to the HDD power connector.
10. Connect the other end of the IDE ribbon cable to the primary IDE connector (blue connector labeled PRI_IDE) on the motherboard. See page 53 for the location of the primary IDE connector.

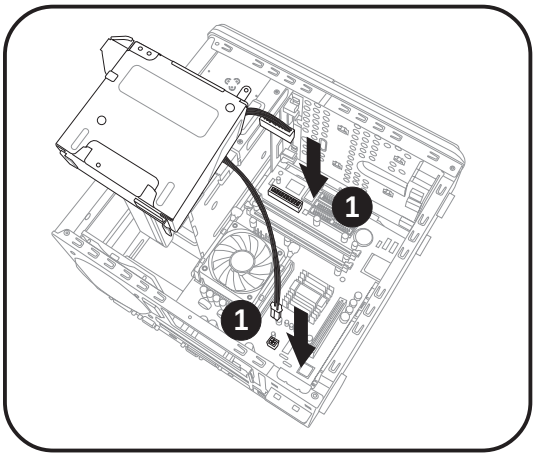


# 2.10 Re-installing the power supply unit

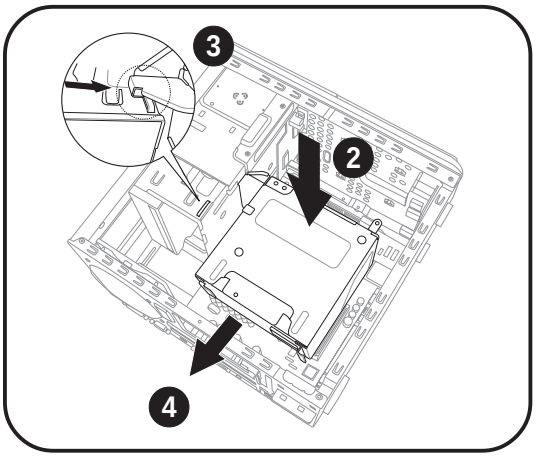
After installing the system components and reconnecting the cables, re-install the power supply unit (PSU).

To reinstall the PSU:

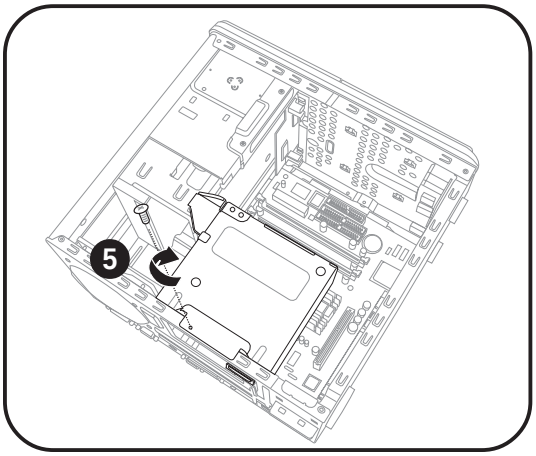
1. Connect the 4-pin and 20-pin power plugs to the ATX12V and ATXPWR connectors on the motherboard. See page 54 for the location of the power connectors.



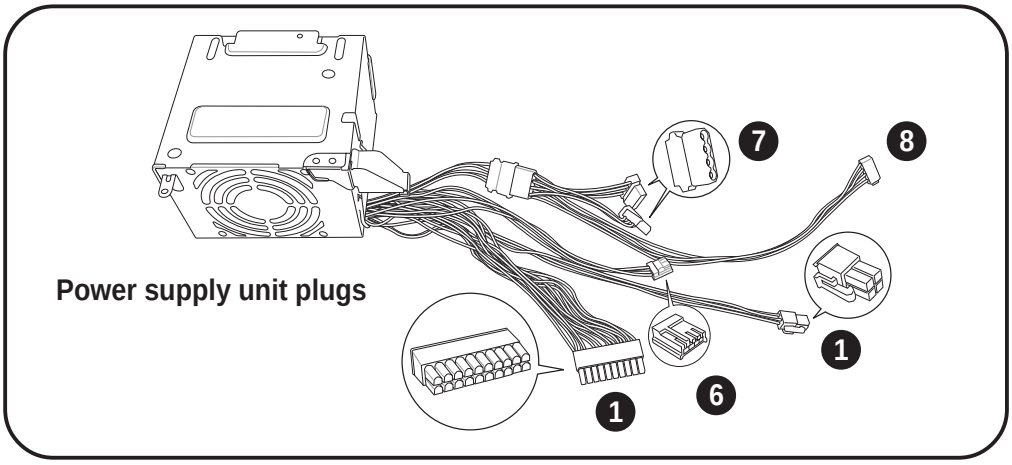

2. Position the PSU over the chassis.
3. Align the PSU side hook with the metal slot located in the side of the optical drive bay.
4. Slide the PSU toward the direction of the rear panel until it fits in place.




5. Secure the PSU with the screw you removed earlier.



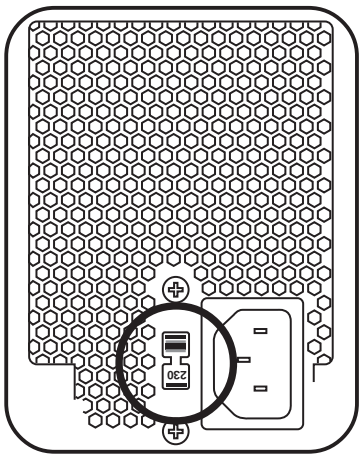

Make sure the PSU cables do not interfere with CPU and chassis fans.




6. Connect the 4-pin power plug to the power connector of the floppy disk drive.
7. Connect the 4-pin power plug(s) to the power connector of the optical drive(s).
8. Connect the 4-pin power plug to the power connector of the hard disk drive.

## 2.10.1 Voltage selector

The PSU has a 115V/230V voltage selector switch located at the side of the power socket. Use this switch to select the appropriate voltage according to the voltage supply in your area.




If the voltage supply in your area is 100-127V, set the switch to 115V.

If the voltage supply in your area is 200-240V, set the switch to 230V.

Setting the switch to 115V in a 230V environment will seriously damage the system!

## 2.10.2 Power supply specifications

### Input characteristics

| Input Voltage Range | Min | Nom | Max |
|---|---|---|---|
| Range 1 | 90V | 115V | 132V |
| Range 2 | 180V | 230V | 264V |
| **Input Frequency Range** | 47 Hz to 63 Hz | | |
| **Maximum Input AC Current** | 5A max. at 115Vac<br>3A max. at 230Vac, full load | | |
| **Inrush Current** | No hazards to occur and damage components | | |
| **Efficiency** | 65% min. at 115Vac and output full load | | |
| **Current Harmonic** | Meets EN61000-3-2 @ 100Vac/50Hz or<br>230 Vac/50Hz at full load | | |
| **EPA** | 50% min. at input 115Vac, 60Hz | | |

### Output characteristics

| Output | Load Range | | Regulation | | Ripple |
|---|---|---|---|---|---|
| Voltage | Min | Max | Min | Max | Max |
| +5V | 1.5A | 21A | -5% | +5% | 50mV$_{p-p}$ |
| +12V | 0.5A | 10A | -5% | +5% | 120mV$_{p-p}$ |
| -12V | 0.05A | 0.8A | -10% | +10% | 150mV$_{p-p}$ |
| +3.3V | 0.3A | 14A | -5% | +5% | 60mV$_{p-p}$ |
| +5VSB | 0.01A | 2A | -5% | +5% | 60mV$_{p-p}$ |

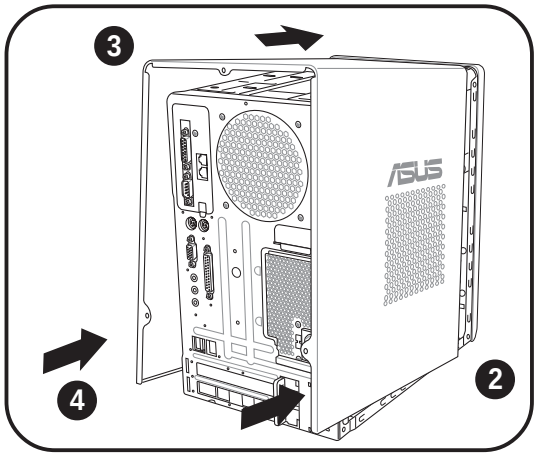
### Over-Voltage Protection (OVP)

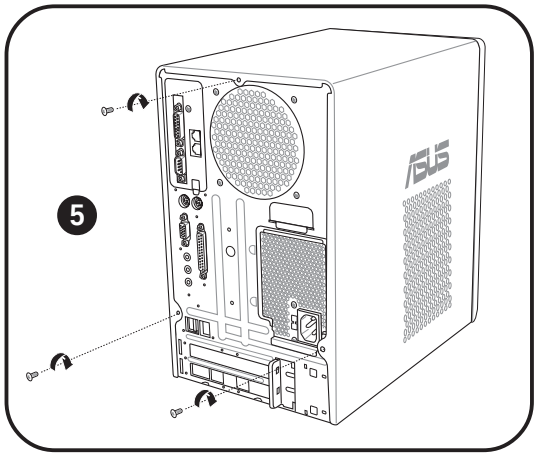
| Output Voltage | Maximum Voltage |
|---|---|
| +3.3V | 4.6V |
| +5V | 6.5V |
| +12V | 15.6V |

# 2.11 Replacing the cover

To replace the cover.

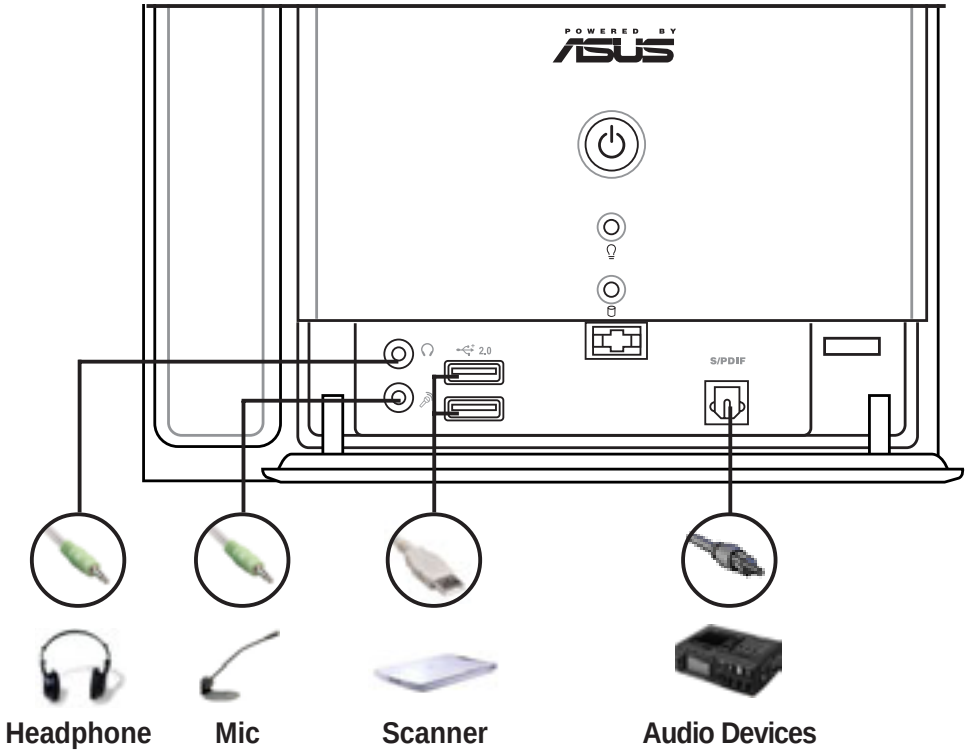
1. Turn the chassis upright.
2. Position the front edge of the cover at least two inches from the front panel cover. Fit the cover tabs with the chassis rail and the front panel tabs.
3. Lower the rear edge of the cover as shown.
4. Push the cover slightly toward the front panel until it fits in place.
5. Secure the cover with three screws you earlier removed.



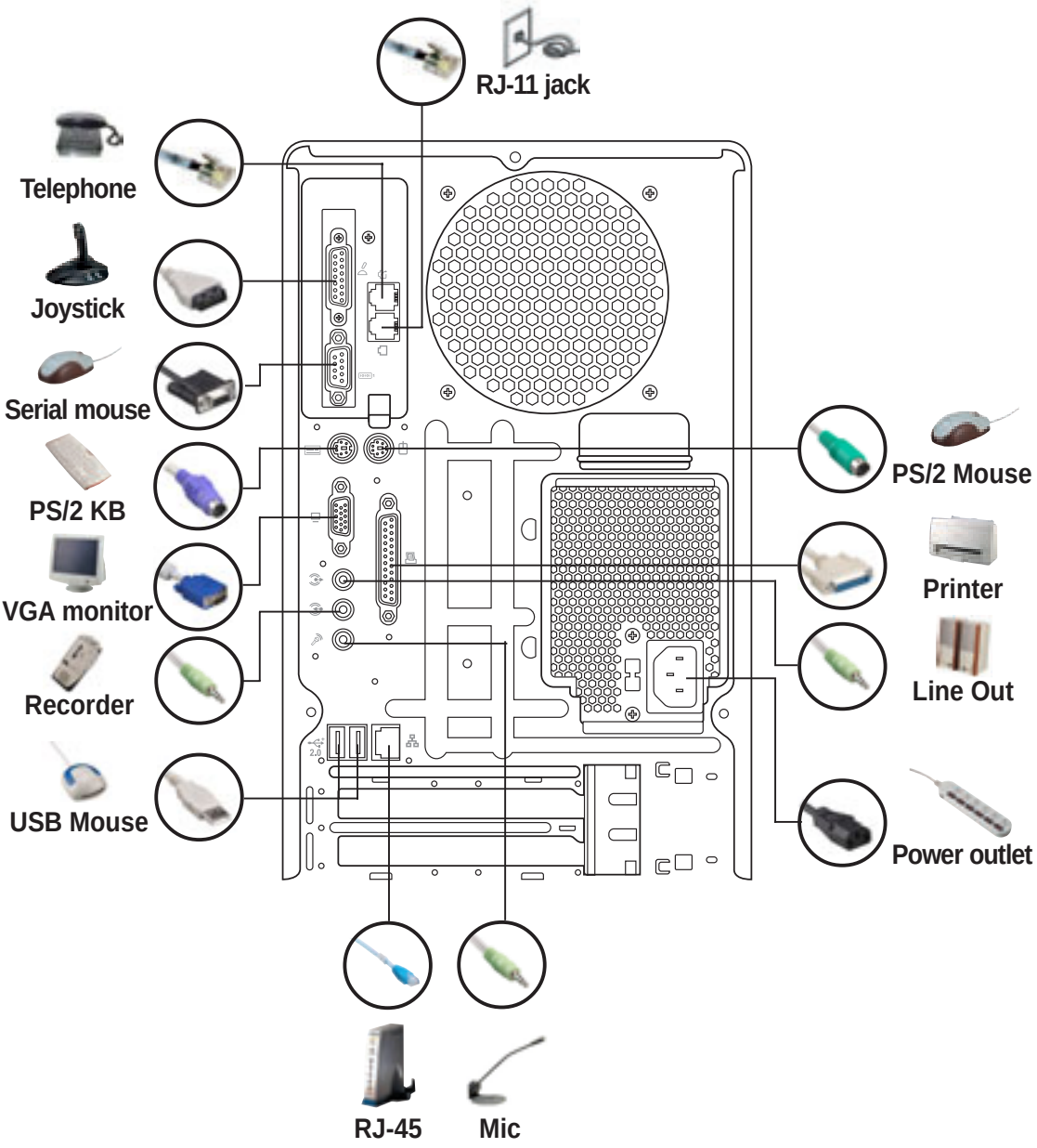



# 2.12 Connecting external devices

## To the front panel



# To the rear panel



# Chapter 3

This chapter helps you power up the system and install drivers and utilities from the support CD.

**ASUS Terminator 2 barebone system**

# Starting up

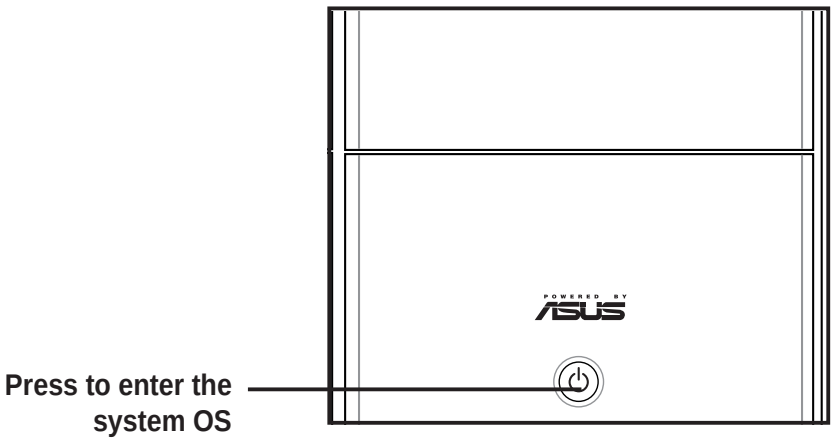
# 3.1 Installing an operating system

Terminator 2 supports Windows® 2000/XP operating systems (OS). Always install the latest OS version and corresponding updates so you can maximize the features of your hardware.

Because motherboard settings and hardware options vary, use the setup procedures presented in this chapter for general reference only. Refer to your OS documentation for more information.

# 3.2 Powering up

Press the system power button (⏻) to enter the OS.



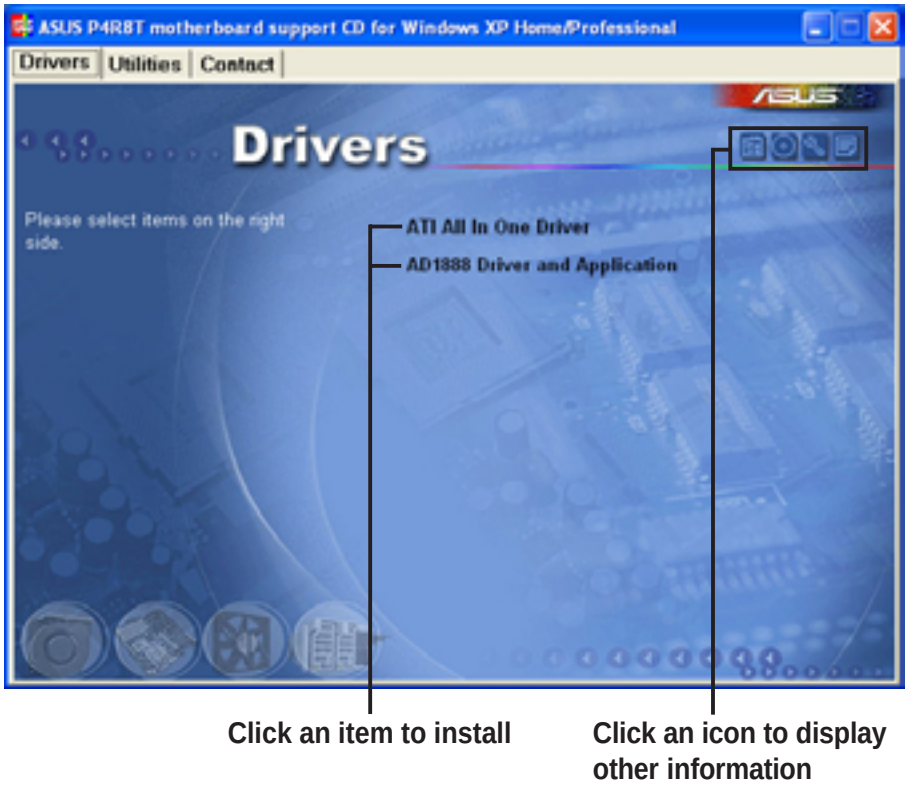

# 3.3 Support CD information

The support CD that came with the system contains useful software and several utility drivers that enhance the system features.

- Screen display and driver options may not be the same for other operating system versions.
- The contents of the support CD are subject to change at any time without notice. Visit the ASUS website for updates.

## 3.3.1 Running the support CD

To begin using the support CD, place the CD in your optical drive. The CD automatically displays the **Drivers** menu if Autorun is enabled in your computer.


ASUS P4R8T motherboard support CD for Windows XP Home/Professional
Drivers
Utilities
Contact
Drivers
Please select items on the right side.
ATI All In One Driver
AD1888 Driver and Application
Click an item to install
Click an icon to display other information

If **Autorun** is NOT enabled in your computer, browse the contents of the support CD to locate the file ASSETUP.EXE from the BIN folder. Double-click the **ASSETUP.EXE** to run the CD.

## 3.3.2 Drivers menu

The drivers menu shows the available device drivers if the system detects installed devices. Install the necessary drivers to activate the devices.

### ATI All In One Driver

Click this item to install the ATI All In One Driver for the P4R8T motherboard.

### AD1888 Driver and Application

This item installs the AD1888 audio driver and SoundMax® application. See page 44 for details.

## 3.3.3 Utilities

The **Utilities** tab displays the applications and softwares that the motherboard supports.

### ASUS PC Probe

This utility continuously monitors vital system information such as fan rotations, CPU temperature, and system voltages, and alerts you on any detected problems. This utility helps you keep your computer in a healthy operating condition.

### Install ASUS Update VX.XX.XX

This item installs the ASUS Update that allows you to update the motherboard BIOS and drivers. This utility requires an Internet connection either through a network or an Internet Service Provider (ISP). See page 67 for details.

### PC-CILLIN 2002

This item installs the PC-cillin 2002 anti-virus program. View the PC-cillin online help for detailed information.

### Adobe® Acrobat Reader® V5.0

This item installs the Adobe® Acrobat Reader®. The Acrobat® Acrobat Reader® software is for viewing files saved in Portable Document Format (PDF).

### ASUS Screensaver

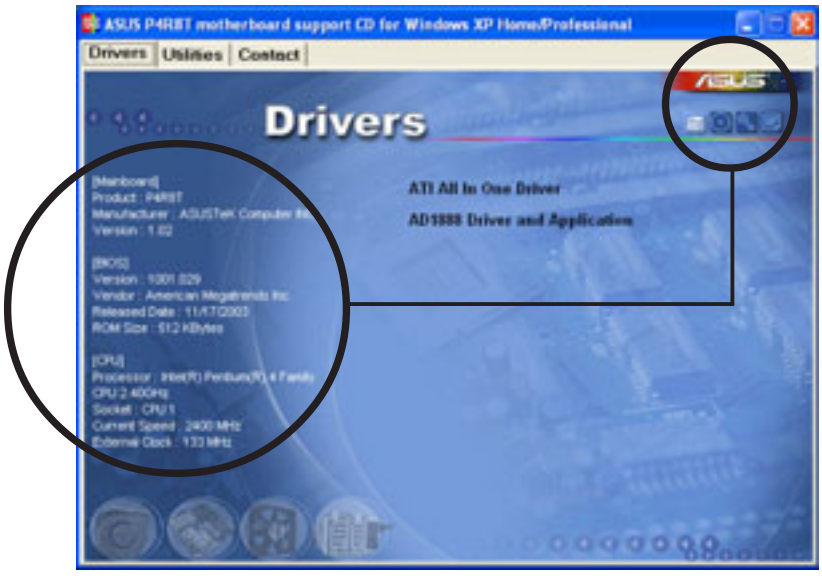
This item installs the ASUS Screensaver.

## 3.3.4 ASUS contact information

Click the **Contact** tab to display the ASUS contact information.

## 3.3.5 Other information

The icons on the top right of the screen provide additional information on the motherboard and the contents of the support CD.



# 3.4 Software information

Most of the applications in the support CD have wizards that will conveniently guide you through the installation. View the online help or readme file that came with the software for more information.

## 3.4.1 Multi-channel audio feature

The AD1888 AC '97 audio CODEC provides 6-channel audio capability. Install the **AD1888 Driver and Application** from the support CD to activate the 6-channel audio feature.

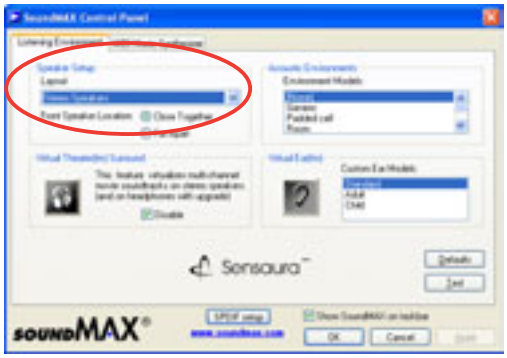
You must use 4-channel or 6-channel speakers for this setup.

### Setting to multi-channel audio

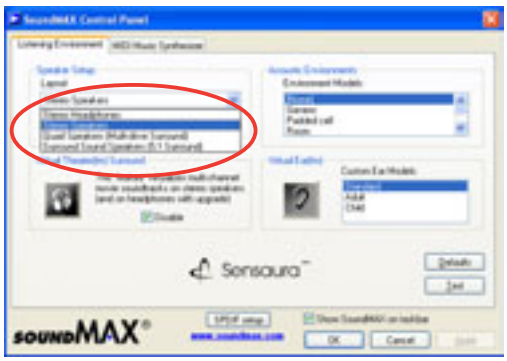
After installing the audio driver, follow these instructions to adjust the audio settings and avail the onboard 6-channel audio feature.

1. From the taskbar, double-click on the **SoundMAX Digital Integrated Audio** icon to display the **SoundMAX Control Panel**.

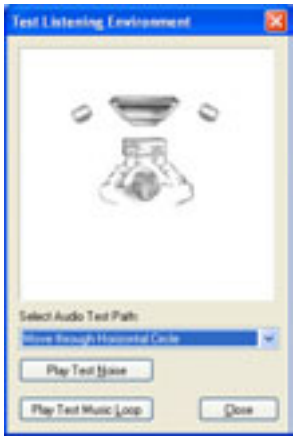
2. The **Listening Environment** tab allows you to set to multi-channel speakers, enable or disable the **Virtual Theater Surround**, and select **Acoustic Environments** and **Virtual Ear**.




3. The default setting is **Stereo Speakers** (2-channel). To set to a 6-channel speaker system, click the arrow under **Speaker Setup** to display a list of options.
4. Select the option **Surround Sound Speakers (5.1 Surround)**.
5. Click the **Apply** button.



6. Click the **Test** button to display the **Test Listening Environment** window.
7. Select the audio test path from the drop-down menu.




8. After selecting an option, test your setting by clicking the **Play Test Noise** button. While testing, you will see a black circle moving on the screen indicating the audio path.

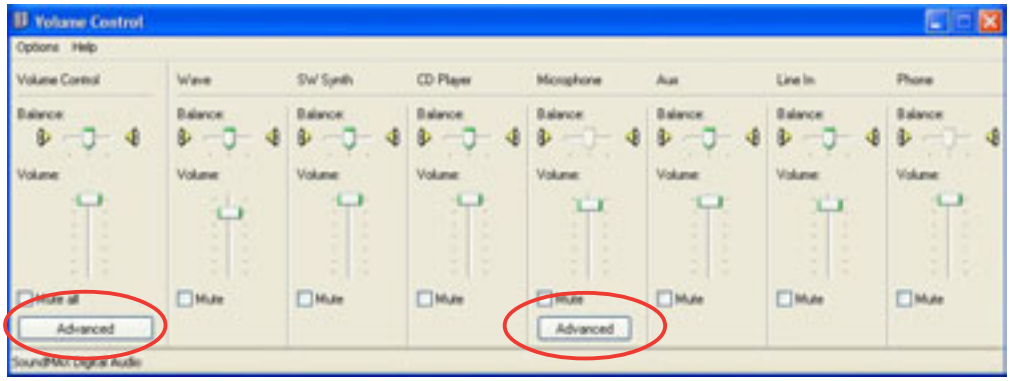
   The **Play Test Noise** button becomes **Stop Playing** button. Click this button at any time to stop playing.
9. Click the **Close** button when done.

10. The **MIDI Music Synthesizer** tab allows you to select a setting for the MIDI.

11. Click the **Synthesizer Default Set** drop-down menu to display a list of options. Choose the desired setting.
12. Click **Apply**, then click **OK** when finished.
13. Reboot the computer.

## Adjusting the volume settings

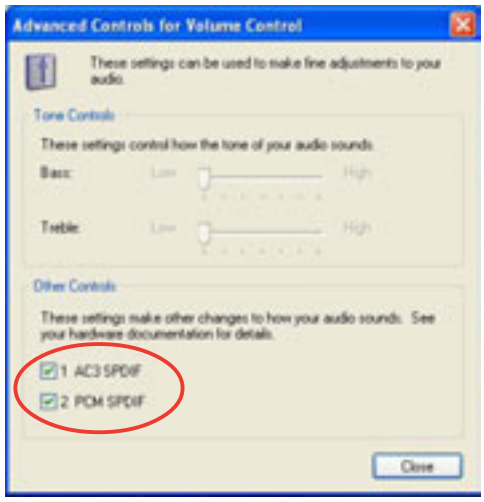
1. After rebooting the system, click on the volume control icon on the Windows® taskbar to display the **Volume Control** window.




2. Click the Volume Control **Advanced** button. The **Advanced Controls for Volume Control** window appears.

   To achieve 6-channel audio capability when playing DVDs, check the boxes opposite **AC3 SPDIF** and **PCM SPDIF**.

   Click **Close**.


Advanced Controls for Volume Control
These settings can be used to make fine adjustments to your audio.
Tone Controls
These settings control how the tone of your audio sounds.
Bass:
Treble:
Other Controls
These settings make other changes to how your audio sounds. See your hardware documentation for details.
1 AC3 SPDIF
2 PCM SPDIF
Close

## Adjusting the microphone settings

1. Click on the Microphone **Advanced** button to display the **Advanced Controls for Microphone** window.
2. Check the box opposite **Mic2 Select** to enable the front panel microphone.
3. Click **Close** for the new settings to take effect.

Advanced Controls for Microphone
These settings can be used to make fine adjustments to your audio.
Tone Controls
These settings control how the tone of your audio sounds.
Bass:
Treble:
Other Controls
These settings make other changes to how your audio sounds. See your hardware documentation for details.
1 Mic2 Select
2 MIC Boost
Close

The rear panel Mic port (pink) is automatically disabled when you enable the front panel Mic port. Only one Mic port works at a time.

## 3.4.2 ASUS Instant Music

The motherboard is equipped with a BIOS-based audio playback feature called **Instant Music**. This feature is supported by the onboard audio AC'97 CODEC and requires an optical drive (CD-ROM, DVD-ROM, CD-RW, or DVD-RW).

1. Instant Music only supports CDs in audio format.
2. Instant Music does not work if you installed and enabled an add-on sound card.
3. Instant Music only supports PS/2 keyboard.
4. Set the optical drive as secondary master device. See page 53 for details.

### To enable ASUS Instant Music:

1. Connect the analog audio cable from the optical drive to the 4-pin CD connector (labeled CD1) on the motherboard. See page 53 for the location of the CD1 connector.

Make sure to connect the optical drive audio cable. Otherwise, you cannot control the audio volume using the Instant Music function keys.

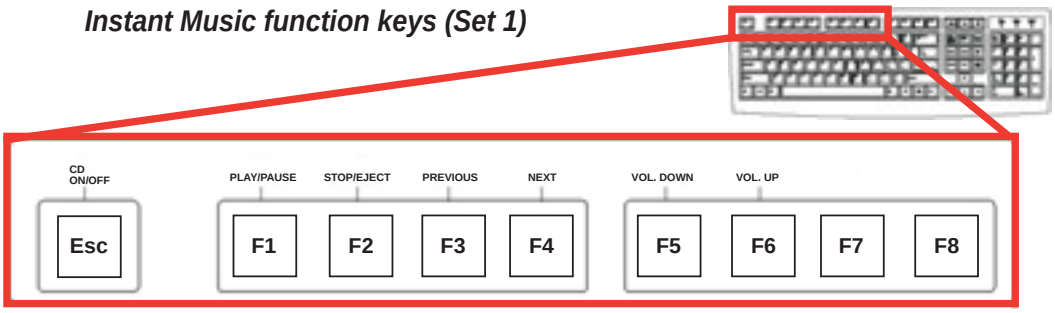
2. Turn on the system and enter BIOS by pressing the **Delete** key during the Power On Self-Tests (POST).
3. In the **Instant Music Configuration** menu, select the item **Instant Music** and set it to **Enabled**. See section 5.4.1 "Instant Music Configuration" on page 76.
4. The **Instant Music CD-ROM Drive** item appears if you enabled Instant Music. Highlight the item then press Enter to display the CD-ROM options.
5. Save your changes and exit BIOS Setup.

1. The Scroll Lock LED is fixed to ON after enabling Instant Music.
2. The Caps Lock LED turns ON when you pause the CD playback.
3. When set to Instant Music mode, the system wake-up features (LAN, keyboard, mouse, USB) are deactivated. In this case, power up the system using the power switch.
4. If the system lost connection or did not detect any optical drive, the Instant Music feature turns OFF (disabled) automatically. A "beep" indicates this condition.

## To use ASUS Instant Music:

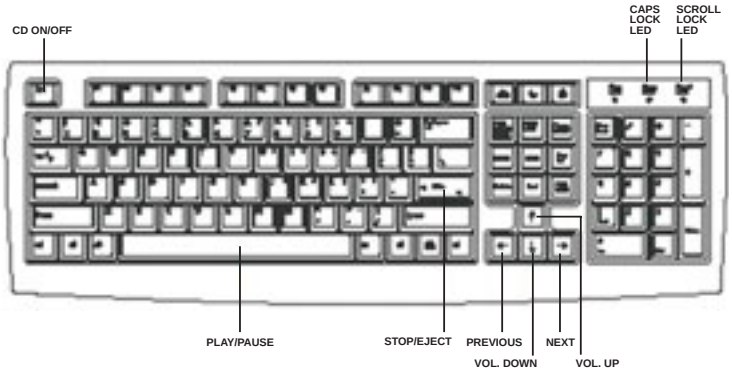
1. Ensure that the power cord is plugged to a grounded power source, so that the system has a standby power.
2. Use either one of the two sets of special function keys on your keyboard to play audio CDs. These keys only function as indicated if you enabled the Instant Music item in BIOS.

***Instant Music function keys (Set 1)***




To guide you in using Instant Music, place the Instant Music label over the function keys on the keyboard. The Instant Music keyboard label comes with your motherboard package.

***Instant Music function keys (Set 2)***




3. Connect speakers or a headphone to the Line Out (lime colored) port on the rear panel for audio output. You may also connect a headphone to the headphone port on the optical drive front panel.
4. Place an audio CD on the drive.
5. Press **Esc** to turn ON Instant Music.
6. Press **F1** or the **Space Bar** to play the first track on the CD.

If there is no CD on the drive and you press F1 or Space Bar, the drive tray ejects.

7. Refer to the Instant Music function key definitions on the previous page to select other tracks or control the volume.
8. Press **F2** or **Enter** *once* to stop playing the CD.
   Press **F2** or **Enter** *one more time* to eject the CD.

# Chapter 4

# Motherboard info

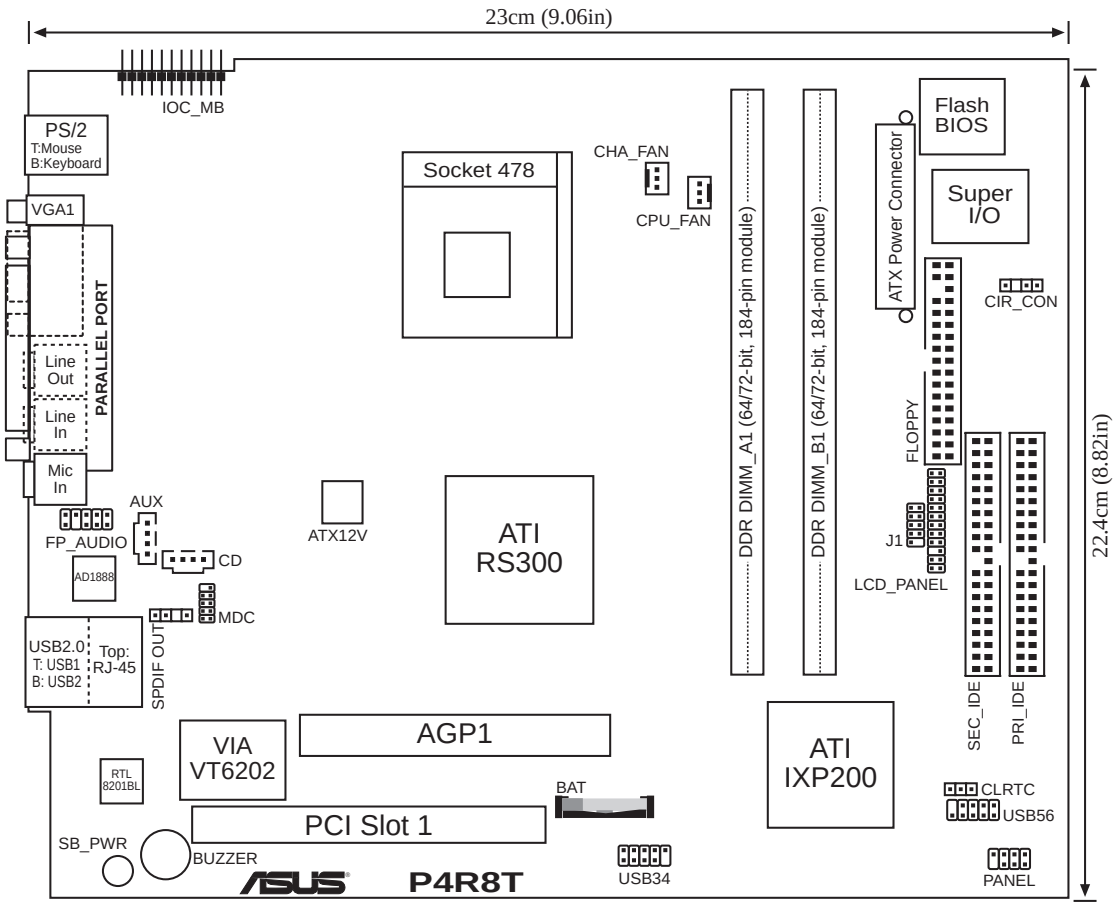
This chapter gives information about the motherboard that comes with the system. This chapter includes the motherboard layout, jumper settings, and connector locations.

**ASUS Terminator 2 barebone system**

# 4.1 Introduction

The ASUS P4R8T motherboard comes already installed in the ASUS Terminator 2 system. This chapter provides technical information about the motherboard for future upgrades or system reconfiguration.

# 4.2 Motherboard layout



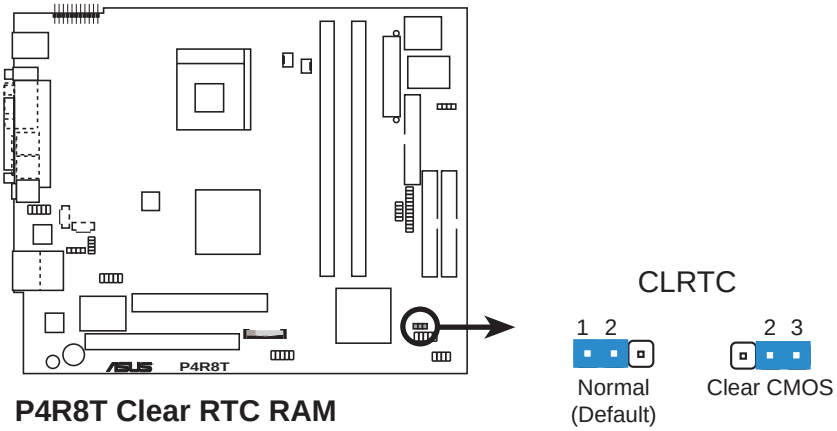
# 4.3 Jumper

## Clear RTC RAM (CLRTC)

This jumper allows you to clear the  Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS RTC RAM data. The RAM data in CMOS, that include system setup information such as system passwords, is powered by the onboard button cell battery.

To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. Remove the battery.
3. Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5-10 seconds, then move the cap back to pins 1-2.
4. Re-install the battery.
5. Plug the power cord and turn ON the computer.
6. Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.




**P4R8T Clear RTC RAM**

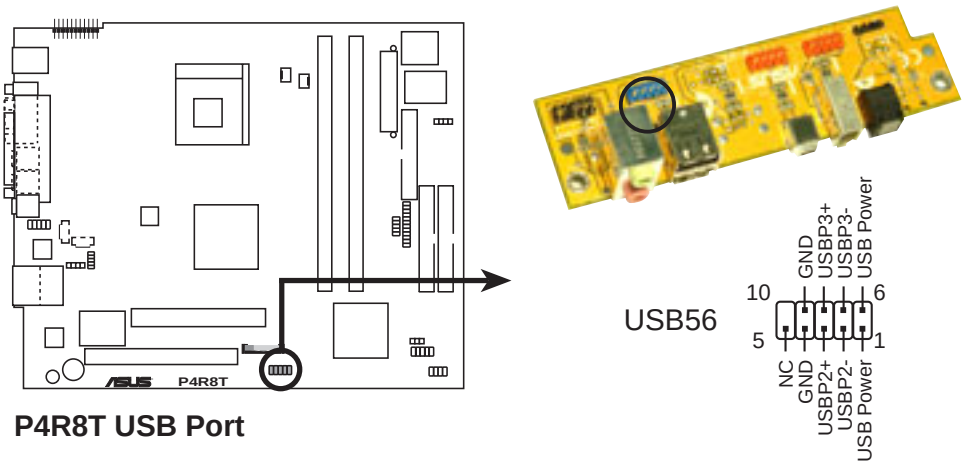
Except when clearing the RTC RAM, never remove the cap on CLRTC jumper default position. Removing the cap will cause system boot failure.

# 4.4 Connectors

This section describes and illustrates the connectors on the motherboard. See page 19 for the description of rear panel connectors.

### 1. Front panel USB connector (10-1 pin USB56)

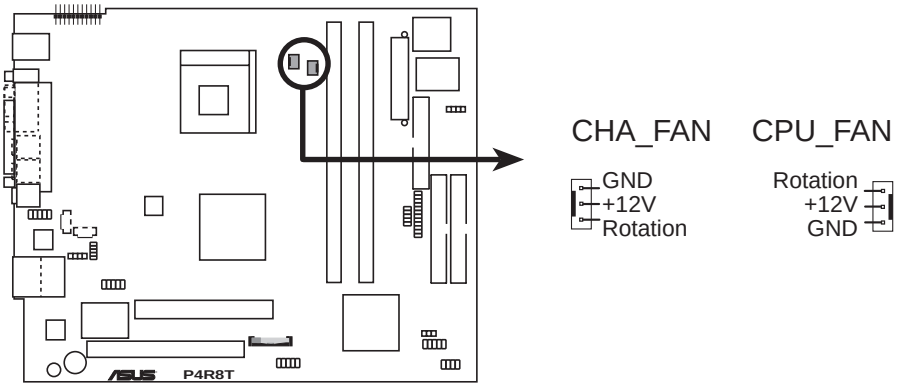
The USB56 header is connected to the USB_2 connector of the front panel I/O daughterboard.




**P4R8T USB Port**

### 2. CPU and chassis fan connectors (3-pin CPU_FAN, CHA_FAN)

The fan connectors support the proprietary CPU fan and chassis fan. Connect the fan cable to the connector matching the black wire to the ground pin.




**P4R8T 12-Volt Cooling Fan Power**

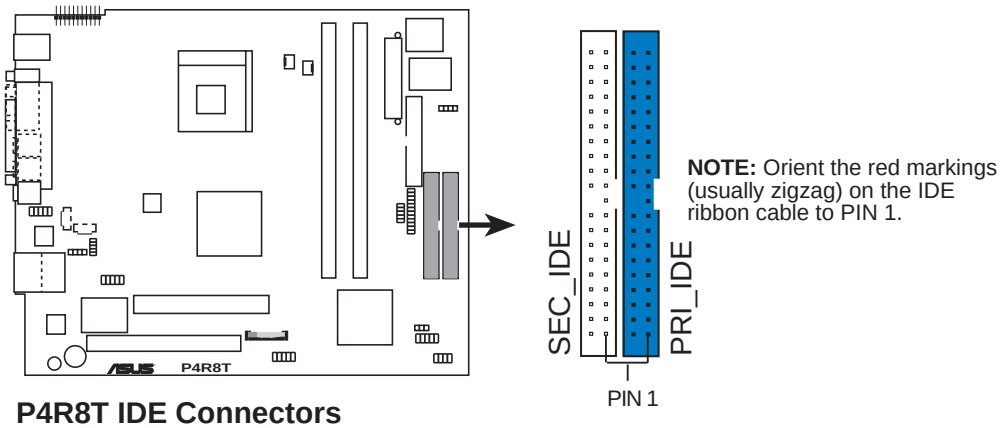
Do not forget to connect the fan cables to the fan connectors. Lack of sufficient air flow within the system may damage the motherboard components. These are not jumpers! DO NOT place jumper caps on the fan connectors!

### 3. IDE connectors (40-1 pin PRI_IDE, SEC_IDE)

The PRI_IDE connector is for the UltraATA100 IDE hard disk ribbon cable. Connect the cable's blue connector to the IDE connector, then connect the gray connector to a secondary master device (optical drive) and the black connector to the UltraATA100 primary master device (hard disk drive). Configure the hard disk drive and the optical drive as primary/secondary master device by adjusting their jumper settings. Refer to their respective documentation for details.

Pin 20 on the IDE connector is removed to match the covered hole on the UltraATA cable connector. This prevents incorrect orientation when you connect the cables.

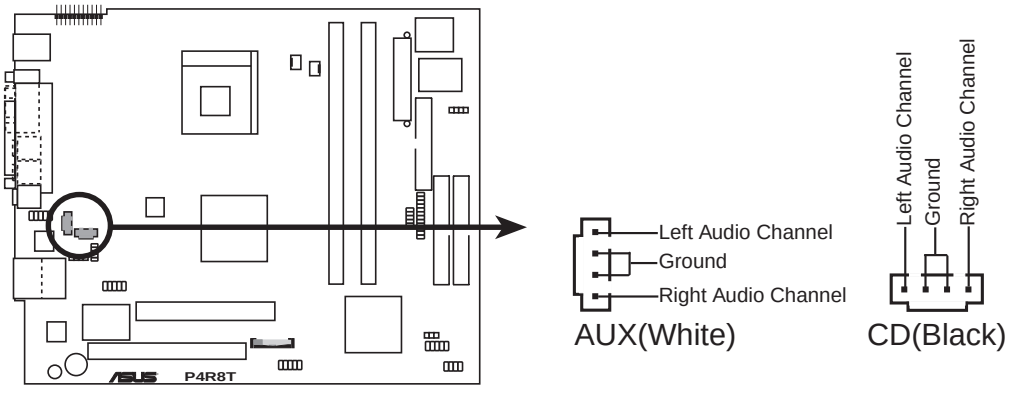
For UltraATA133 IDE devices, use an 80-conductor IDE cable.




**P4R8T IDE Connectors**

### 4. Internal audio connectors (4-pin AUX1, CD1)

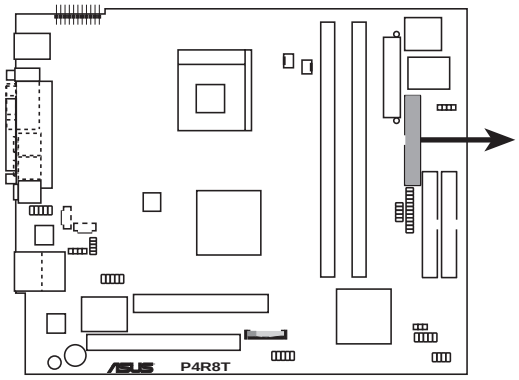
These connectors allow you to receive stereo audio input from sound sources such as a CD-ROM, TV tuner, or MPEG card.

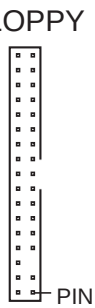



**P4R8T Internal Audio Connectors**

## 5. Floppy disk drive connector (34-1 pin FLOPPY1)

This connector supports the provided floppy drive ribbon cable. After connecting one end to the motherboard, connect the other end to the floppy disk drive. (Pin 5 is removed to prevent incorrect insertion when using ribbon cables with pin 5 plug).



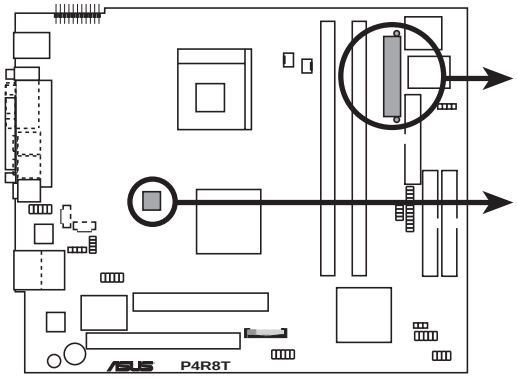



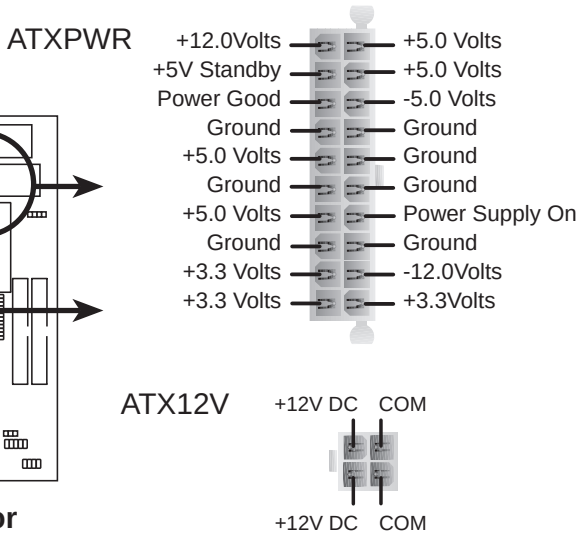

**NOTE:** Orient the red markings on the floppy ribbon cable to PIN 1.

**P4R8T Floppy Disk Drive Connector**

## 6. ATX power connectors (20-pin ATXPWR, 4-pin ATX12V)

These connectors are for the 20-pin and 4-pin power plugs from the power supply unit. The plugs from the power supply unit are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit. See page 39 for details on the power supply unit.

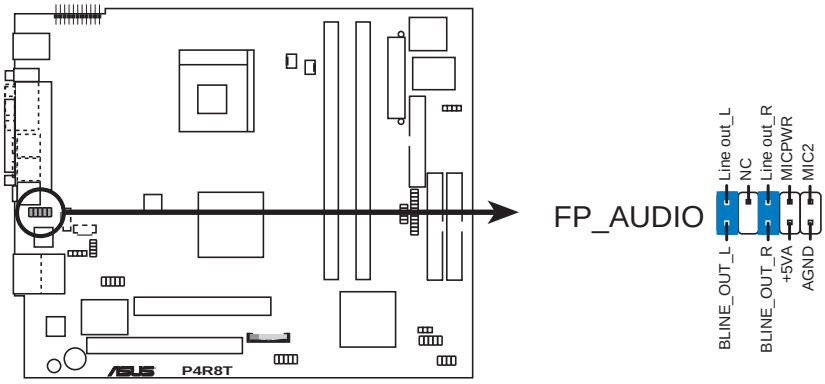



**P4R8T ATX Power Connector**

## 7. Front panel audio connector (10-1 pin FP_AUDIO)

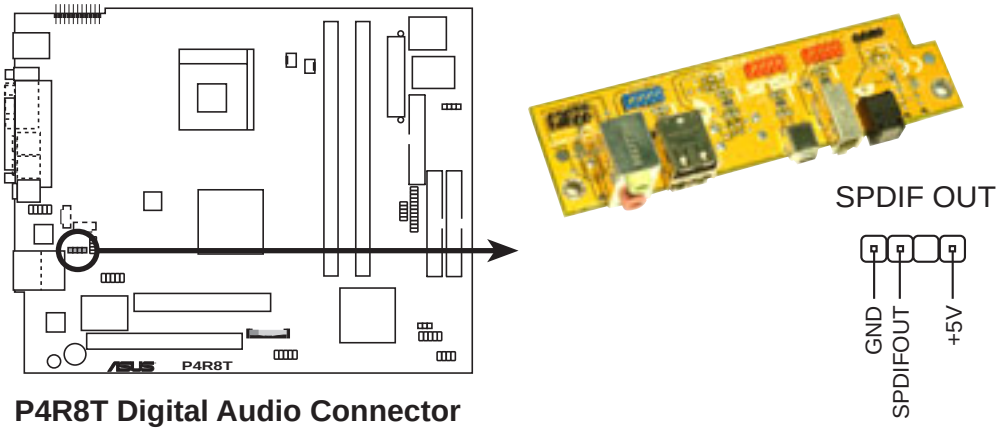
This interface is connected to the J1 connector in the front panel I/O daugtherboard to support the front panel audio I/O ports.




**P4R8T Front Panel Audio Connector**

## 8. Digital audio connector (4-1 pin SPDIF_OUT)

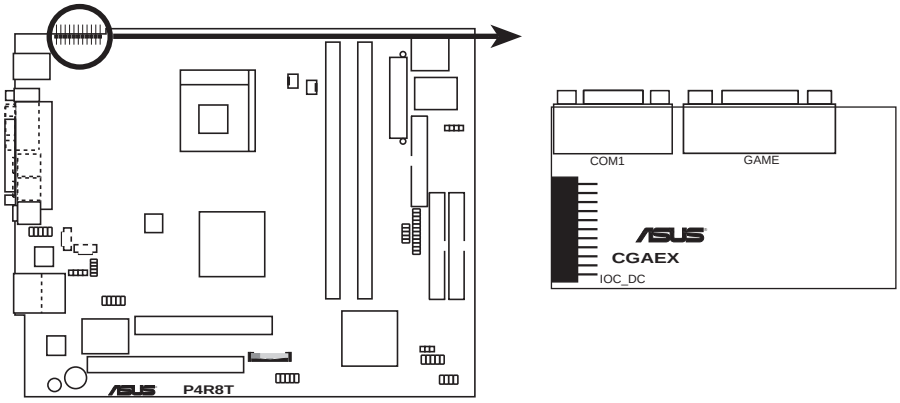
The SPDIF_OUT is connected to the SPDIF_OUT2 connector in the front panel I/O daughterboard to support the optical S/PDIF port.




**P4R8T Digital Audio Connector**

## 9. I/O extension module (22-pin IOC_MB)

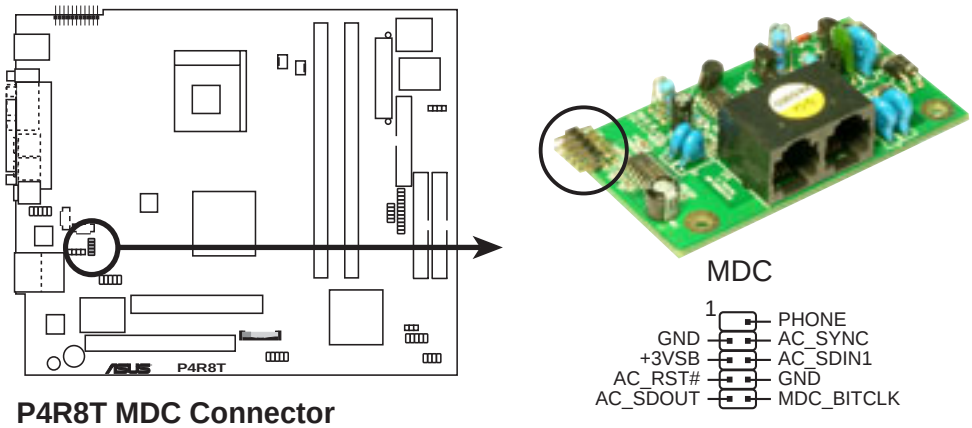
This connector is for the CGAEX extension module.




**P4R8T IOC_MB Connector**

## 10. Optional modem connector (10-1 pin MDC)

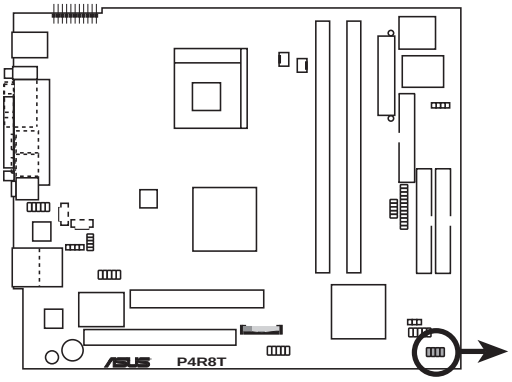
This interface connects to the JP2 connector in the optional modem module.

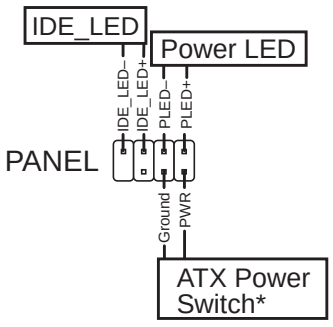



**P4R8T MDC Connector**

## 11. System panel connector (8-1 pin PANEL)

This connector accommodates several system front panel functions.




**P4R8T System Panel Connector**

* Requires an ATX power supply.

- **Power LED Lead**

  This 2-pin connector connects to the system power LED. The LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

- **ATX Power Switch**

  This connector connects a switch that controls the system power. Pressing the power switch turns the system between ON and SLEEP, or ON and SOFT OFF, depending on the BIOS or OS settings. Pressing the power switch while in the ON mode for more than 4 seconds turns the system OFF.

- **IDE LED Lead**

  This 2-pin connector supplies power to the hard disk drive activity LED. The read or write activities of any device connected to the primary or secondary IDE connector cause this LED to light up.

# Chapter 5

This chapter tells how to change system settings through the BIOS Setup menus and describes the BIOS parameters.

# BIOS setup

# 5.1 Managing and updating your BIOS

The following utilities allow you to manage and update the motherboard Basic Input/Output System (BIOS) setup.

1. **AFUDOS** *(Updates the BIOS in DOS mode using a bootable floppy disk.)*
2. **ASUS EZ Flash** *(Updates the BIOS using a floppy disk during POST.)*
3. **CrashFree BIOS 2** *(Updates the BIOS using a bootable floppy disk or the support CD when the BIOS gets corrupted.)*
4. **ASUS Update** *(Updates the BIOS in Windows® environment.)*

Refer to the corresponding section for each utility.

### Important notes

- It is recommended that you save a copy of the **original motherboard BIOS file** to a **bootable floppy disk** in case you need to restore the BIOS in the future. Copy the original motherboard BIOS using the AFUDOS or the ASUS Update utilities.
- A **working BIOS file** for this motherboard is in the support CD. Use this file only when you do not have a copy of the original motherboard BIOS file in a floppy disk.
- Visit the ASUS website and download the latest BIOS file for this motherboard using the ASUS Update utility.

## 5.1.1 Creating a bootable floppy disk

1. Do either one of the following to create a bootable floppy disk.

   **DOS environment**

   Insert a 1.44 MB floppy disk into the drive. At the DOS prompt, type:

   **format A:/S** then press <Enter>.

   **Windows® 98SE/ME environment**

   a. From your Windows desktop, click on **Start**, then select **My Computer**.
   b. Double-click on **Add/Remove Programs** icon from the Control Panel window.
   c. Click on the **Startup Disk** tab, then on **Create Disk...** button.
   d. Insert a 1.44 MB floppy disk when prompted. Follow the succeeding screen instructions to complete the process.

**Windows® XP environment**

a. Insert a 1.44 MB floppy disk into the floppy disk drive.

b. From your Windows desktop, click on **Start**, then select **My Computer**.

c. Select the **3 1/2 Floppy Drive** icon.

d. Click **File** from the menu, then select **Format**. A **Format 3 1/2 Floppy Disk** window appears.

e. Select **Create an MS-DOS startup disk** from the format options field, then click **Start**.

2. Copy the original (or the latest) motherboard BIOS to the bootable floppy disk.

## 5.1.2 Using AFUDOS to copy the current BIOS

The AFUDOS.EXE utility can also be used to copy the current system BIOS settings to a floppy or hard disk. The copy can be used as a backup in case the system BIOS fails or gets corrupted.

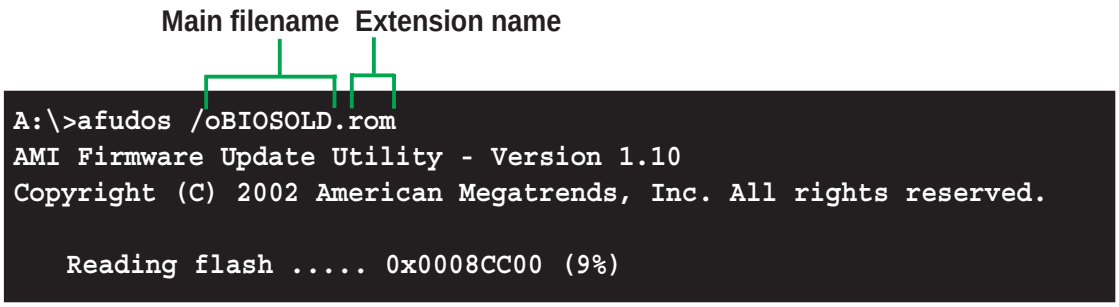
1. At the DOS prompt, type the command line:

   **afudos** /o***<filename>***

   where "filename" can be any user provided filename of not more than eight (8) alpha-numeric characters for the main filename and three (3) alpha-numeric characters for the extension name.

   Press the **Enter** key.

The BIOS information on the screen is for reference only. What you see on your screen may not be exactly the same as shown.


Main filename
Extension name
A:\>afudos /oBIOSOLD.rom
AMI Firmware Update Utility - Version 1.10
Copyright (C) 2002 American Megatrends, Inc. All rights reserved.
Reading flash ..... 0x0008CC00 (9%)

2. The utility will copy the current system BIOS by default to the floppy disk. Make sure that the floppy disk is not write-protected and have enough space (at least 600KB) to store the file.

```
A:\>afudos /oBIOSOLD.rom
AMI Firmware Update Utility - Version 1.10
Copyright (C) 2002 American Megatrends, Inc. All rights reserved.

   Reading flash ..... done

A:\>
```

When the BIOS copy process is complete, the utility returns to the DOS prompt.

## 5.1.3 Using AFUDOS to update the BIOS

The AFUDOS is a DOS-based application that lets you update the BIOS file using a bootable floppy diskette. AFUDOS also allows you to copy the original BIOS file to a floppy diskette.

To update the BIOS using the AFUDOS.EXE:

1. Visit the ASUS website (www.asus.com) to download the latest BIOS file for your motherboard. Save the BIOS file to the bootable floppy disk you created earlier.

Write down the BIOS file name to a piece of paper. You need to type the **exact BIOS file name** at the prompt.

2. Copy the AFUDOS.EXE utility from the support CD to the bootable floppy disk that contains the BIOS file.
3. Boot the system from the floppy disk.
4. At the DOS prompt, type the command line:

   afudos /i*<filename.rom>*

   where “filename.rom” means the latest (or original) BIOS file that you copied to the bootable floppy disk.

The screen displays the status of the update process.

The BIOS information on the screen is for reference only. What you see on your screen may not be exactly the same as shown.

```
A:\>afudos /ip4r8t.rom
AMI Firmware Update Utility - Version 1.10
Copyright (C) 2002 American Megatrends, Inc. All rights reserved.

   Reading file ..... done
   Erasing flash .... done
   Writing flash .... 0x0008CC00 (9%)
```

DO NOT shutdown or reset the system while updating the BIOS! Doing so may cause system boot failure!

When the BIOS update process is complete, the utility returns to the DOS prompt.

```
A:\>afudos /ip4r8t.rom
AMI Firmware Update Utility - Version 1.10
Copyright (C) 2002 American Megatrends, Inc. All rights reserved.

   Reading file ..... done
   Erasing flash .... done
   Writing flash .... 0x0008CC00 (9%)
   Verifying flash .. done

A:\>
```

5. Reboot the system from the hard disk.

## 5.1.4 Using ASUS EZ Flash to update the BIOS

The ASUS EZ Flash feature allows you to easily update the BIOS without having to go through the long process of booting from a floppy disk and using a DOS-based utility. The EZ Flash is built-in the BIOS LPC chip so it is accessible by simply pressing <Alt> + <F2> during the Power-On Self Tests (POST).

To update the BIOS using ASUS EZ Flash:

1. Visit the ASUS website (www.asus.com) to download the latest BIOS file for your motherboard and rename it to **P4R8T.ROM**. Save the BIOS file to a floppy disk.
2. Reboot the system.
3. To launch EZ Flash, press <Alt> + <F2> during POST to display the following.

```
User recovery requested. Starting BIOS recovery...
Checking for floppy...
```

If there is no floppy disk found in the drive, the error message "**Floppy not found!**" appears.

If the correct BIOS file is not found in the floppy disk, the error message "**P4R8T.ROM not found!**"

4. Insert the floppy disk that contains the BIOS file. If the **P4R8T.ROM** file is found in the floppy disk, EZ Flash performs the BIOS update process and automatically reboots the system when done.

DO NOT shutdown or reset the system while updating the BIOS! Doing so may cause system boot failure!

```
User recovery requested. Starting BIOS recovery...
Checking for floppy...
Floppy found!
Reading file "p4r8t.rom". Completed.
Start flashing...
Flashed successfully. Rebooting.
```

## 5.1.5 Recovering the BIOS with CrashFree BIOS 2

The CrashFree BIOS 2 auto recovery tool allows you to restore BIOS from the motherboard support CD, or from a floppy disk that contains the BIOS file, in case the current BIOS on the motherboard fails or gets corrupted.

- Prepare the **support CD** that came with the motherboard or a **floppy disk that contains the motherboard BIOS** (P4R8T.ROM) before proceeding with the BIOS update process.
- If you have saved a copy of the original motherboard BIOS to a bootable floppy disk, you may also use this disk to restore the BIOS. See section "5.1.1 Creating a bootable floppy disk."

To recover the BIOS from a floppy disk:

1. Boot the system.
2. When a corrupted BIOS is detected, the following message appears.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
```

3. Insert a floppy disk that contains the original, or the latest, BIOS file for this motherboard (**P4R8T.ROM**). If the BIOS file that you downloaded from the ASUS website has a different filename (e.g. **P4R8T11.ROM**), rename it to **P4R8T.ROM**. The BIOS update process continues when the **P4R8T.ROM** is found.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
Floppy found!
Reading file "p4r8t.rom". Completed.
Start flashing...
```

DO NOT shutdown or reset the system while updating the BIOS! Doing so may cause system boot failure!

4. When the BIOS update process is complete, reboot the system.

To recover the BIOS from the support CD:

Make sure the optical drive is set as secondary master device when recovering the BIOS using the support CD. See page 53 for details.

1. Boot the system.
2. When a corrupted BIOS is detected, the following screen message appears.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
```

The system automatically checks the CD-ROM if there is no floppy disk found in the drive.

3. Place the support CD in the optical drive. The support CD contains the original BIOS for this motherboard.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
Floppy not found!
Checking for CD-ROM...
CD-ROM found.
Reading file "p4r8t.rom". Completed.
Start flashing...
```

DO NOT shutdown or reset the system while updating the BIOS! Doing so may cause system boot failure!

4. When the BIOS update process is complete, reboot the system.

The recovered BIOS may not be the latest BIOS version for this motherboard. Visit the ASUS website (www.asus.com) to download the latest BIOS file.

## 5.1.6 ASUS Update

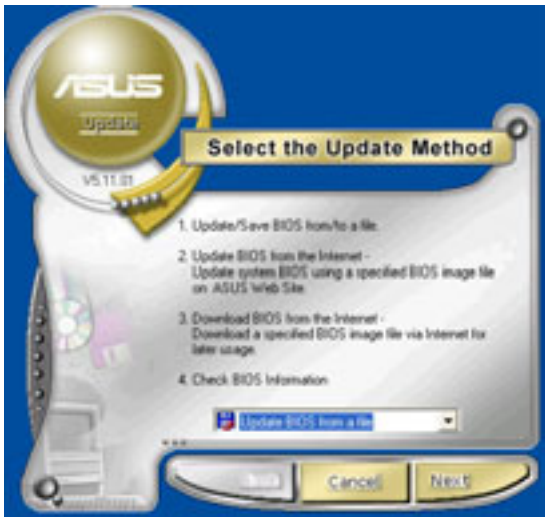
The ASUS Update is a utility that allows you to update the motherboard BIOS in Windows® environment. This utility is available in the support CD that comes with the motherboard package. ASUS Update requires an Internet connection either through a network or an Internet Service Provider (ISP).

To install ASUS Update:

1. Place the support CD in the optical drive. The **Drivers** menu appears.
2. Click the **Utilities** tab, then click **Install ASUS Update VX.XX.XX**. See page 42- for the **Utilities** menu screen.
3. The ASUS Update utility is copied into your system.

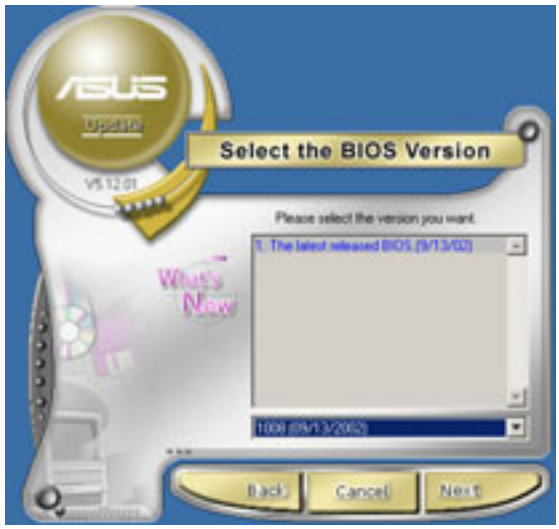
To update the BIOS using the ASUS Update:

1. Launch the utility from the Windows desktop by clicking **Start > Programs > ASUS > ASUSUpdate > ASUSUpdate**. The ASUS Update initial screen appears.
2. Select your desired update method, then click **Next**.

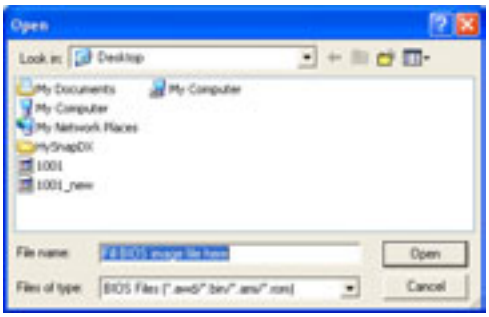


3. If you selected updating/ downloading from the Internet, select the ASUS FTP site nearest you to avoid network traffic, or choose **Auto Select**. Click **Next**.

4. From the FTP site, select the BIOS version that you wish to download. Click **Next**.
5. Follow the instructions on the succeeding screens to complete the update process.




If you selected the option to update the BIOS from a file, a window pops up prompting you to locate the file. Select the file, click **Save**, then follow the screen instructions to complete the update process.



# 5.2 BIOS Setup program

This motherboard supports a programmable Firmware Hub (FWH) that you can update using the provided utility described in section "5.1 Managing and updating your BIOS."

Use the BIOS Setup program when you are installing a motherboard, reconfiguring your system, or prompted to "Run Setup". This section explains how to configure your system using this utility.

Even if you are not prompted to use the Setup program, you may want to change the configuration of your computer in the future. For example, you may want to enable the security password feature or make changes to the power management settings. This requires you to reconfigure your system using the BIOS Setup program so that the computer can recognize these changes and record them in the CMOS RAM of the firmware hub.

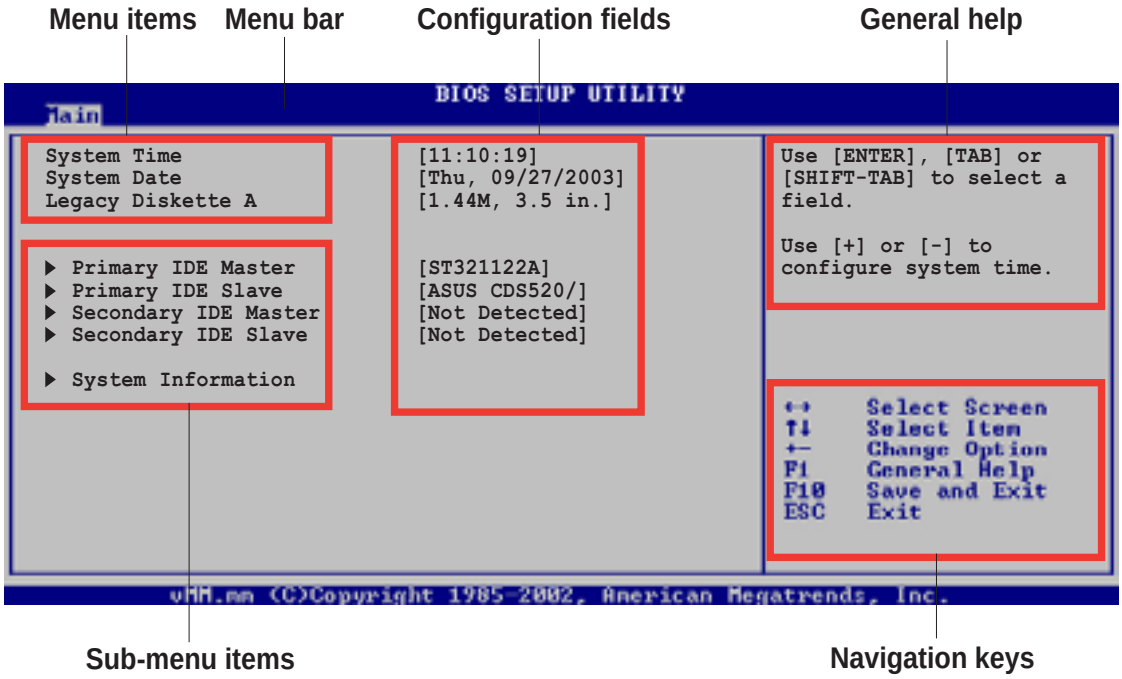
The firmware hub stores the Setup utility. When you start up the computer, the system provides you with the opportunity to run this program. Press <Delete> during the Power-On Self Test (POST) to enter the Setup utility, otherwise, POST continues with its test routines.

If you wish to enter Setup after POST, restart the system by pressing <Ctrl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

The Setup program is designed to make it as easy to use as possible. It is a menu-driven program, which means you can scroll through the various sub-menus and make your selections among the predetermined choices.

Because the BIOS software is constantly being updated, the following BIOS setup screens and descriptions are for reference purposes only, and may not exactly match what you see on your screen.

## 5.2.1 BIOS menu screen




## 5.2.2 Menu bar

The menu bar on top of the screen has the following main items:

| | |
|---|---|
| **Main** | For changing the basic system configuration |
| **Advanced** | For changing the advanced system settings |
| **Power** | For changing the advanced power management (APM) configuration |
| **Boot** | For changing the system boot configuration |
| **Exit** | For selecting the exit options and loading default settings |

To select an item on the menu bar, press the right or left arrow key on the keyboard until the desired item is highlighted.

## 5.2.3 Navigation keys

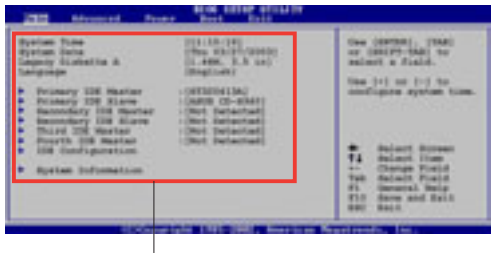
At the **bottom right corner** of a menu screen are the navigation keys for that particular menu. Use the navigation keys to select items in the menu and change the settings.

Some of the navigation keys differ from one screen to another.

## 5.2.4 Menu items

The highlighted item on the menu bar displays the specific items for that menu. For example, selecting **Main** shows the Main menu items.

The other items (Advanced, Power, Boot, and Exit) on the menu bar have their respective menu items.



Main menu items

## 5.2.5 Sub-menu items

An item with a sub-menu on any menu screen is distinguished by a solid triangle before the item. To display the sub-menu, select the item and press <Enter>.

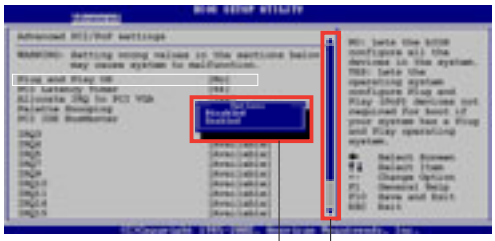
## 5.2.6 Configuration fields

These fields show the values for the menu items. If an item is user-configurable, you may change the value of the field opposite the item. You can not select an item that is not user-configurable.

A configurable field is enclosed in brackets, and is highlighted when selected. To change the value of a field, select it then press <Enter> to display a list of options. Refer to “5.2.7 Pop-up window.”

## 5.2.7 Pop-up window

Select a menu item then press Enter to display a pop-up window with the configuration options for that item.



Pop-up window

Scroll bar

## 5.2.8 Scroll bar

A scroll bar appears on the right side of a menu screen when there are items that do not fit on the screen. Press **Up/Down arrow keys** or **PageUp/PageDown keys** to display the other items on the screen.

## 5.2.9 General help

At the top right corner of the menu screen is a brief description of the selected item.

# 5.3 Main menu

When you enter the BIOS Setup program, the Main menu screen appears giving you an overview of the basic system information.

Refer to section 5.2.1 BIOS menu screen" for information on the menu screen items and how to navigate through them.

BIOS SETUP UTILITY
Main
System Time [11:10:19]
System Date [Thu, 09/27/2003]
Legacy Diskette A [1.44M, 3.5 in.]
Primary IDE Master [ST321122A]
Primary IDE Slave [ASUS CDS520/]
Secondary IDE Master [Not Detected]
Secondary IDE Slave [Not Detected]
System Information
Use [ENTER], [TAB] or [SHIFT-TAB] to select a field.
Use [+] or [-] to configure system time.
Select Screen
Select Item
Change Option
F1 General Help
F10 Save and Exit
ESC Exit
vMM.nn (C)Copyright 1985-2002, American Megatrends, Inc.

## 5.3.1 System Time [xx:xx:xxxx]

This item allows you to set the system time.

## 5.3.2 System Date [Day xx/xx/xxxx]

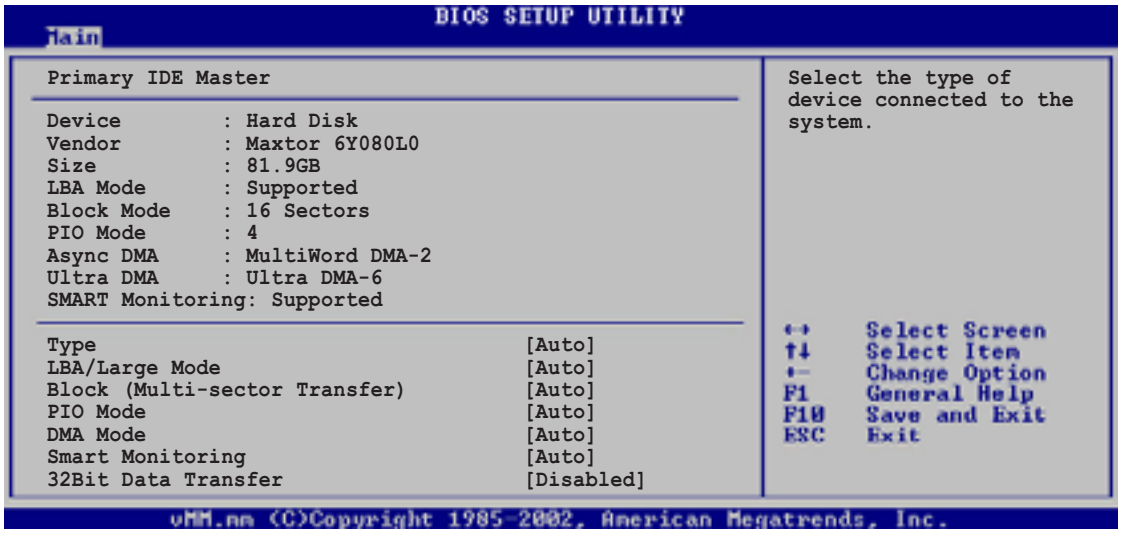
This item allows you to set the system date.

## 5.3.3 Legacy Diskette A [1.44M, 3.5 in.]

Sets the type of floppy drive installed. Configuration options: [Disabled] [360K, 5.25 in.] [1.2M , 5.25 in.] [720K , 3.5 in.] [1.44M, 3.5 in.] [2.88M, 3.5in.]

## 5.3.4 Primary and Secondary IDE Master/Slave

While entering Setup, BIOS auto-detects the presence of IDE devices. There is a separate sub-menu for each IDE device. Select a device item then press Enter to display the IDE device information.




The values opposite the dimmed items (Device, Vendor, Size, LBA Mode, Block Mode, PIO Mode, Async DMA, Ultra DMA, and SMART monitoring) are auto-detected by BIOS and are not user-configurable. These items show N/A if no IDE device is installed in the system.

*Type [Auto]*

Selects the type of IDE drive. Setting to Auto allows automatic selection of the appropriate IDE device type. Select CDROM if you are specifically configuring a CD-ROM drive. Select ARMD (ATAPI Removable Media Device) if your device is either a ZIP, LS-120, or MO drive. Configuration options: [Not Installed] [Auto] [CDROM] [ARMD]

*LBA/Large Mode [Auto]*

Enables or disables the LBA mode. Setting to Auto enables the LBA mode if the device supports this mode, and if the device was not previously formatted with LBA mode disabled. Configuration options: [Disabled] [Auto]

*Block (Multi-sector Transfer) [Auto]*

Enables or disables data multi-sectors transfers. When set to Auto, the data transfer from and to the device occurs multiple sectors at a time if the device supports multi-sector transfer feature. When set to Disabled, the data transfer from and to the device occurs one sector at a time. Configuration options: [Disabled] [Auto]

*PIO Mode [Auto]*

Selects the PIO mode. Configuration options: [Auto] [0] [1] [2] [3] [4]

*DMA Mode [Auto]*

Selects the DMA mode. Configuration options: [Auto] [SWDMA0] [SWDMA1] [SWDMA2] [MWDMA0] [MWDMA1] [MWDMA2] [UDMA0] [UDMA1] [UDMA2] [UDMA3] [UDMA4] [UDMA5]

*SMART Monitoring [Auto]*

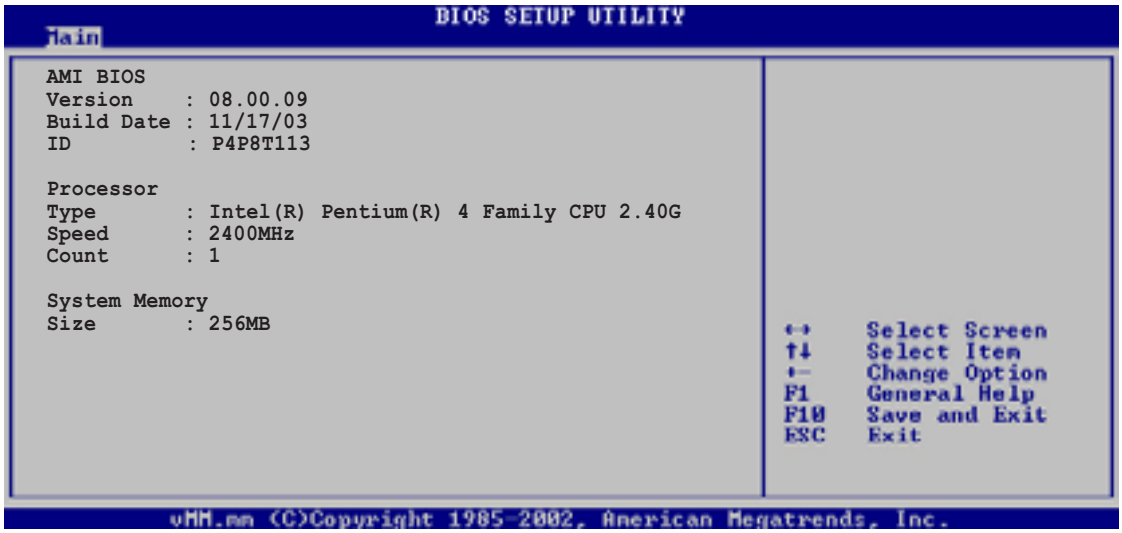
Sets the Smart Monitoring, Analysis, and Reporting Technology. Configuration options: [Auto] [Disabled] [Enabled]

*32Bit Data Transfer [Disabled]*

Enables or disables 32-bit data transfer.
Configuration options: [Disabled] [Enabled]

## 5.3.5 System Information

This menu gives you an overview of the general system specifications. The items in this menu are auto-detected by BIOS.




### AMIBIOS

This item displays the auto-detected BIOS information.

### Processor

This item displays the auto-detected CPU specification.

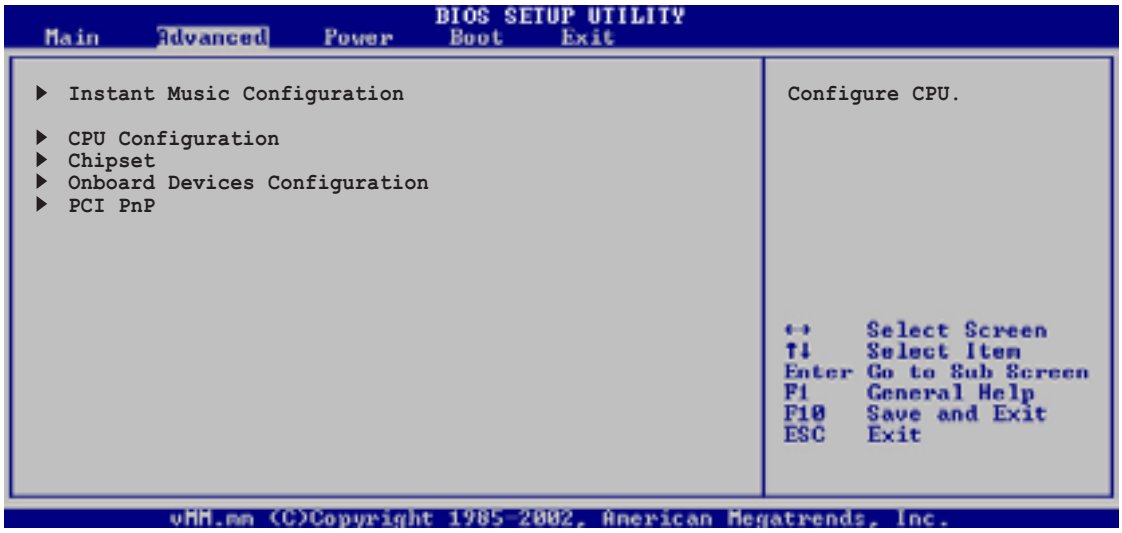
### System Memory

This item displays the auto-detected system memory.

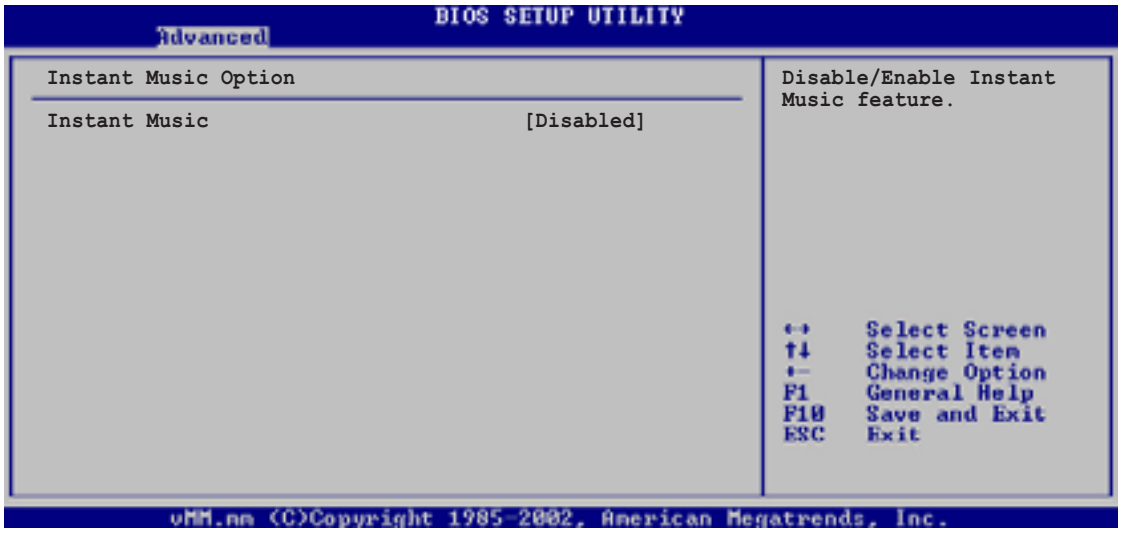
# 5.4 Advanced menu

The Advanced menu items allow you to change the settings for the CPU and other system devices.

Take caution when changing the settings of the Advanced menu items. Incorrect field values may cause the system to malfunction.



## 5.4.1 Instant Music Configuration




### Instant Music [Disabled]

Allows you to enable or disable the Instant Music feature in BIOS. Configuration options: [Disabled] [Enabled]

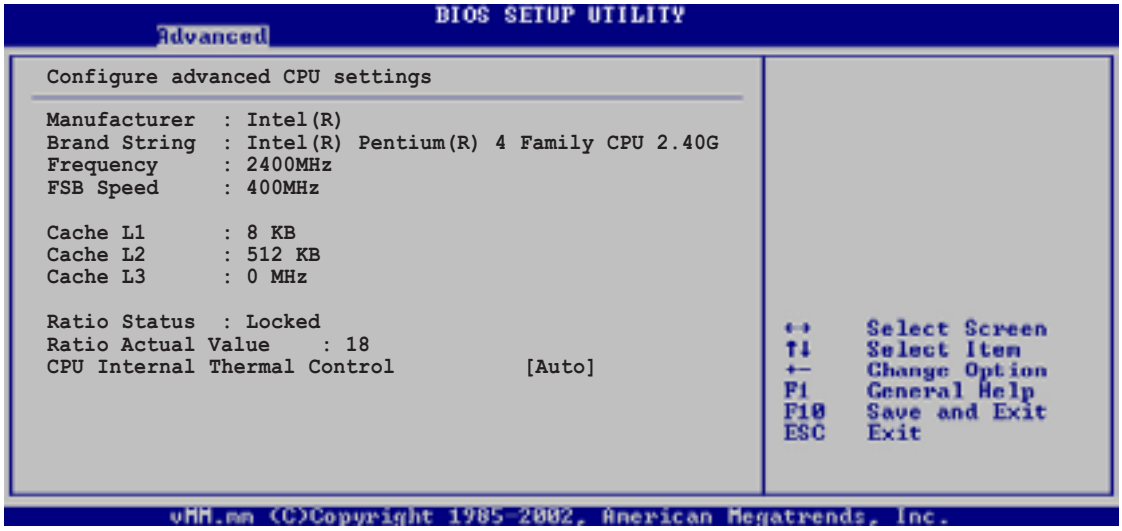
- When Instant Music is enabled, the PS/2 keyboard power up feature is automatically disabled. See page 47 for details on the Instant Music feature.
- The following item appears only if you enable the Instant Music option.

### Instant Music CD-ROM Drive [IDE Secondary Master]

Allows you to select the optical drive that you wish to use for the Instant Music CD playback. Set the Instant Music optical drive to [IDE Secondary Master].

## 5.4.2 CPU Configuration

The items in this menu show the CPU-related information auto-detected by BIOS.

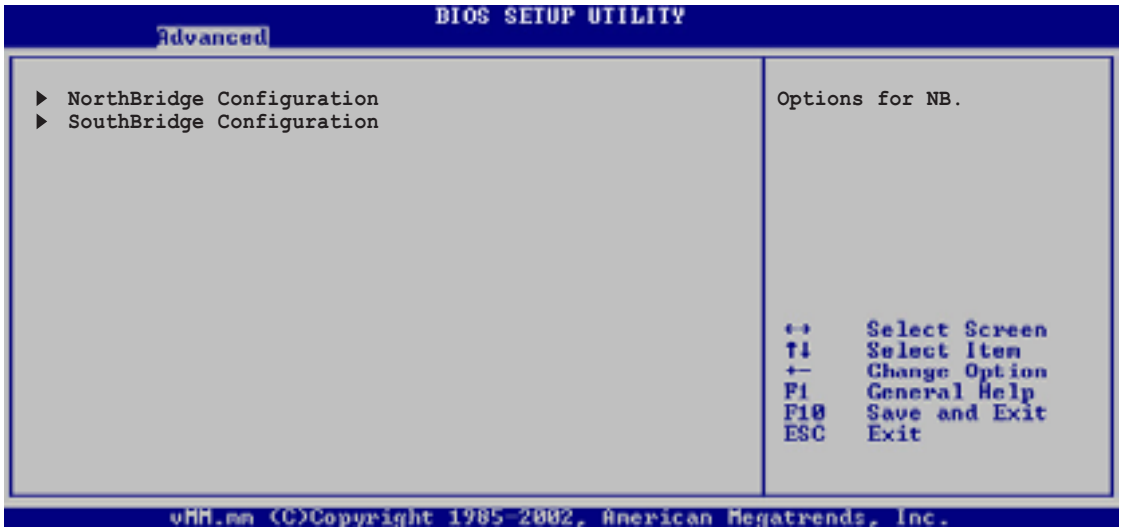

BIOS SETUP UTILITY
Advanced
Configure advanced CPU settings
Manufacturer : Intel(R)
Brand String : Intel(R) Pentium(R) 4 Family CPU 2.40G
Frequency : 2400MHz
FSB Speed : 400MHz
Cache L1 : 8 KB
Cache L2 : 512 KB
Cache L3 : 0 MHz
Ratio Status : Locked
Ratio Actual Value : 18
CPU Internal Thermal Control [Auto]
↔ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
vAA.mm (C)Copyright 1985-2002, American Megatrends, Inc.

### CPU Internal Thermal Control [Auto]

This item allows you to activate the CPU Internal Thermal control feature. Configuration options: [Auto] [Disabled]

## 5.4.3 Chipset

The Chipset menu items allow you to change the advanced chipset settings. Select an item then press Enter to display the sub-menu.



## NorthBridge Configuration

BIOS SETUP UTILITY
Advanced
Init. Graphic Adapter Priority [PCI/AGP]
DRAM CAS Select [Slow]
AGP Aperture Size [64MB]
UMA Frame Buffer Size [64MB]
Select which graphics controller to use as the primary boot device.
↔ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
vAA.aa (C)Copyright 1985-2002, American Megatrends, Inc.

### Init. Graphic Adapter Priority [PCI/AGP]

Allows selection of the graphics controller to use as primary boot device. Configuration options: [PCI/AGP] [AGP/PCI]

### DRAM CAS Select [Slow]

Allows you to select DRAM CAS speed.
Configuration options: [Slow] [Fast]

### AGP Aperture Size [64MB]

Allows you to select the size of mapped memory for AGP graphic data. Configuration options: [32MB] [64MB] [128MB] [256MB] [512MB]

### UMA Frame Buffer Size [64MB]

Allows you to select the size of the onboard graphics controller memory use. Configuration options: [8MB] [16MB] [32MB] [64MB] [128MB] [None]

## SouthBridge Configuration

### AC97 Audio Device [Auto]

[Auto] allows the BIOS to detect whether you are using any audio device. If an audio device is detected, the onboard audio controller is enabled; if no audio device is detected, the controller is disabled.
Configuration options: [Auto] [Disabled]

### MC97 Audio Device [Auto]

[Auto] allows the BIOS to detect whether you are using any modem device. If a modem is detected, the onboard modem controller is enabled; if no modem is detected, the controller is disabled.
Configuration options: [Auto] [Disabled]

### OnBoard LAN Device [Enabled]

Allows you to enable or disable the onboard LAN controller.
Configuration options: [Enabled] [Disabled]

### USB 1.1 OHCI Controllers [Enabled]

Allows you to enable or disable the USB 1.1 OHCI controller.
Configuration options: [Enabled] [Disabled]

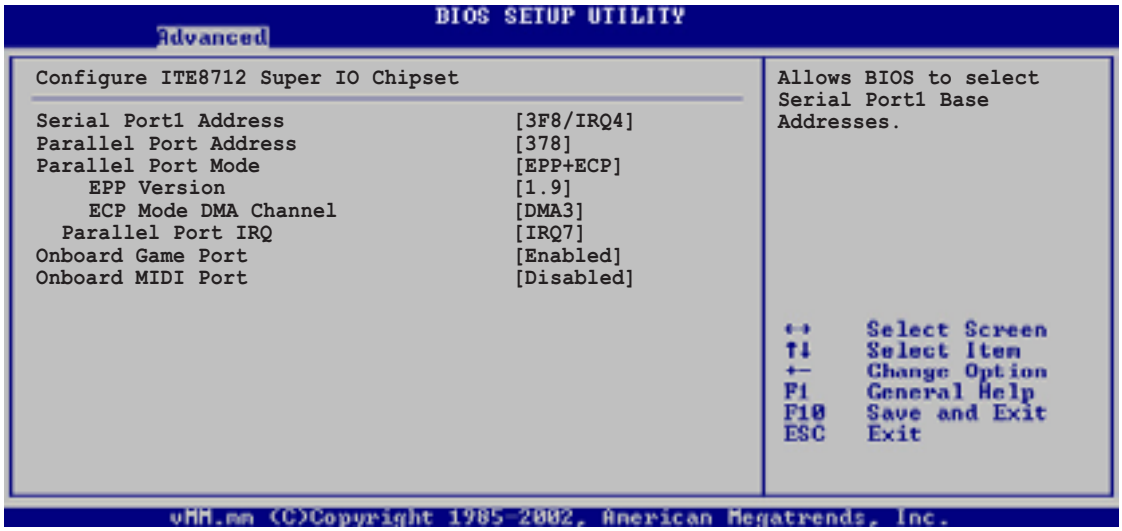
### USB 2.0 EHCI Controller [Enabled]

Allows you to enable or disable the USB 2.0 EHCI controller.
Configuration options: [Enabled] [Disabled]

### Legacy USB Support [Auto]

Allows you to enable or disable support for legacy USB devices. Setting to Auto allows the system to detect the presence of USB devices at startup. If detected, the USB controller legacy mode is enabled. If no USB device is detected, the legacy USB support is disabled.
Configuration options: [Enabled] [Disabled] [Auto]

## 5.4.4 Onboard Devices Configuration




### Serial Port1 Address [3F8/IRQ4]

Allows you to select the Serial Port1 base address.Configuration options: [Disabled] [3F8/IRQ4] [2F8/IRQ3] [3E8/IRQ4] [2E8/IRQ3]

### Parallel Port Address [378]

Allows you to select the Parallel Port base addresses.
Configuration options: [378] [278] [3BC] [Disabled]

### Parallel Port Mode [EPP+ECP]

Allows you to select the Parallel Port mode.
Configuration options: [Normal] [EPP] [ECP] [EPP+ECP]

*EPP Version [1.9]*

Allows selection of the Parallel Port EPP version. This item appears only when the **Parallel Port Mode** is set to **EPP**.
Configuration options: [1.9] [1.7]

*ECP Mode DMA Channel [DMA3]*

Allows selection of the Parallel Port ECP DMA channel. This item appears only when the **Parallel Port Mode** is set to **ECP**.
Configuration options: [DMA0] [DMA1] [DMA3]

*Parallel Port IRQ [IRQ7]*

Allows you to select the Parallel Port IRQ.
Configuration options: [IRQ5] [IRQ7]

### Onboard Game Port [Enabled]

Allows you to enable or disable the Game port.
Configuration options: [Enabled] [Disabled]

### Onboard MIDI Port [Disabled]

Allows you to select the MIDI port address or to disable the port. Configuration options: [Disabled] [300/330]

## 5.4.5 PCI PnP

The PCI PnP menu items allow you to change the advanced settings for PCI/PnP devices. The menu includes setting IRQ and DMA channel resources for either PCI/PnP or legacy ISA devices, and setting the memory size block for legacy ISA devices.

Take caution when changing the settings of the PCI PnP menu items. Incorrect field values may cause the system to malfunction.

BIOS SETUP UTILITY
Advanced
Advanced PCI/PnP settings
WARNING: Setting wrong values in the sections below may cause system to malfunction.
Plug and Play OS [No]
PCI Latency Timer [64]
Allocate IRQ to PCI VGA [Yes]
Palette Snooping [Disabled]
PCI IDE BusMaster [Enabled]
IRQ3 [Available]
IRQ4 [Available]
IRQ5 [Available]
IRQ7 [Available]
IRQ9 [Available]
IRQ10 [Available]
IRQ11 [Available]
IRQ14 [Available]
IRQ15 [Available]
NO: Lets the BIOS configure all the devices in the system. YES: Lets the operating system configure Plug and Play (PnP) devices not required for boot if your system has a Plug and Play operating system.
↔ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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### Plug and Play O/S [No]

When set to [No], BIOS configures all the devices in the system. When set to [Yes] and if you installed a Plug & Play operating system, the operating system configures the Plug & Play devices not required for boot. Configuration options: [No] [Yes]

### PCI Latency Timer [64]

Allows you to select the value in units of PCI clocks for the PCI device latency timer register. Configuration options: [32] [64] [96] [128] [160] [192] [224] [248]

### Allocate IRQ to PCI VGA [Yes]

When set to [Yes], BIOS assigns an IRQ to PCI VGA card if the card requests for an IRQ. When set to [No], BIOS does not assign an IRQ to the PCI VGA card even if requested. Configuration options: [No] [Yes]

## Palette Snooping [Disabled]

When set to [Enabled], the pallete snooping feature informs the PCI devices that an ISA graphics device is installed in the system so that the latter can function correctly. Setting to [Disabled] deactivates this feature. Configuration options: [Disabled] [Enabled]

## PCI IDE BusMaster [Enabled]

Allows BIOS to use PCI bus mastering when reading/writing to IDE devices. Configuration options: [Disabled] [Enabled]

## IRQ xx [Available]

When set to [Available], the specific IRQ is free for use of PCI/PnP devices. When set to [Reserved], the IRQ is reserved for legacy ISA devices. Configuration options: [Available] [Reserved]

# 5.5 Power menu

The Power menu items allow you to change the settings for the Advanced Power Management (APM). Select an item then press Enter to display the configuration options.

## 5.5.1 Suspend Mode [S1&S3]

Allows you to select the ACPI state to be used for system suspend.
Configuration options: [S1 (POS) Only] [S1&S3]

## 5.5.2 Repost Video on S3 Resume [Yes]

Determines whether to invoke VGA BIOS POST on S3/STR resume.
Configuration options: [Yes] [No]

## 5.5.3 ACPI 2.0 Support [No]

Allows you to add more tables for ACPI 2.0 specifications.
Configuration options: [No] [Yes]

## 5.5.4 ACPI APIC Support [Enabled]

Allows you to enable or disable the ACPI support in the ASIC. When set to Enabled, the ACPI APIC table pointer is included in the RSDT pointer list.
Configuration options: [Disabled] [Enabled]

## 5.5.5 APM Configuration

BIOS SETUP UTILITY
Main Advanced Power Boot Exit
Restore on AC Power Loss [Power Off]
Power on with PS/2 Keyboard [Disabled]
Power on with PS/2 Mouse [Disabled]
RTC Resume [Disabled]
Go into On/Off, or Suspend when Power button is pressed.
↔ Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
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### Restore on AC Power Loss [Power Off]

When set to [Power Off], the system goes into off state after an AC power loss. When set to Power On, the system goes on after an AC power loss. Configuration options: [Power Off] [Power On]

### Power On with PS/2 Keyboard [Disabled]

This parameter allows you to use specific keys on the keyboard to turn on the system. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead. Configuration options: [Disabled] [Enabled]

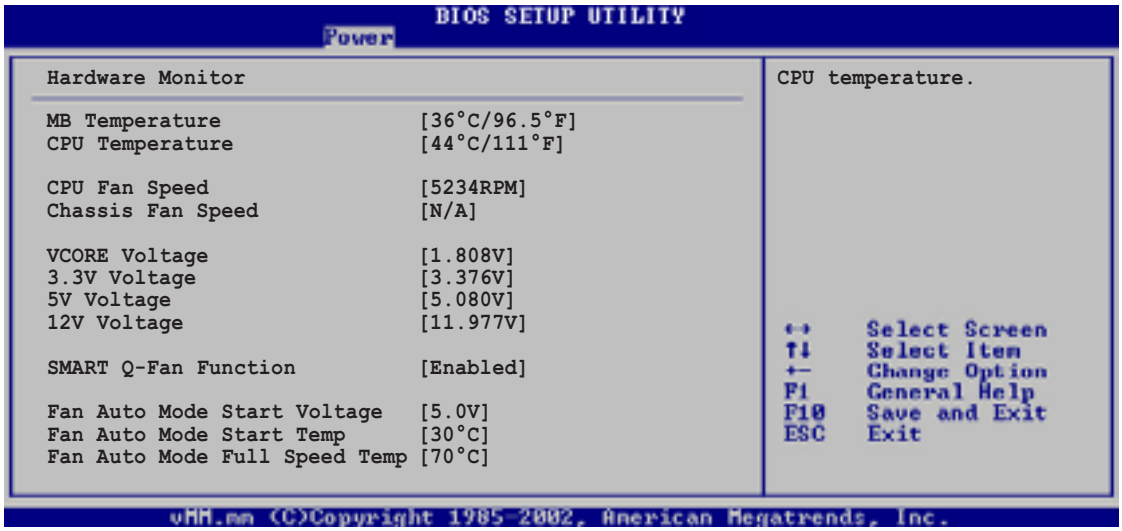
### Power On with PS/2 Mouse [Disabled]

This parameter allows you to use the PS/2 mouse to turn on the system. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead. Configuration options: [Disabled] [Enabled]

### RTC Resume [Disabled]

Allows you to enable or disable RTC to generate a wake event. When this item is set to Enabled, the items RTC Alarm Date, RTC Alarm Hour, RTC Alarm Minute, and RTC Alarm Second appear with set values. Configuration options: [Disabled] [Enabled]

## 5.5.6 Hardware Monitor




### MB Temperature [xxxºC/xxxºF]
### CPU Temperature [xxxºC/xxxºF]

The onboard hardware monitor automatically detects and displays the motherboard and CPU temperatures. Select [Disabled] if you do not wish to display the detected temperatures.

### CPU Fan Speed [xxxxRPM] or [N/A]
### Chassis Fan Speed [xxxxRPM] or [N/A]

The onboard hardware monitor automatically detects and displays the CPU, chassis, and power fan speeds in rotations per minute (RPM). If any of the fans is not connected to the motherboard, the specific field shows N/A.

### VCORE Voltage, 3.3V Voltage, 5V Voltage, 12V Voltage

The onboard hardware monitor automatically detects the voltage output through the onboard voltage regulators.

If any of the monitored items is out of range, the following error message appears: “Hardware Monitor found an error. Enter Power setup menu for details”. You will then be prompted to “Press F1 to continue or DEL to enter SETUP”.

### SMART Q-Fan Function [Enabled]

This item allows you to enable or disable the ASUS Smart Q-Fan feature that smartly adjusts the fan speeds for more efficient system operation. Configuration options: [Enabled] [Disabled]

The following items appear only when the **Smart Q-Fan Function** item is set to Enabled.

## Fan Auto Mode Start Voltage [5.0V]

This item allows you to select the voltage for the auto start fan feature. The fan starts when the system reaches the specified voltage.
Configuration options: [4.0V] [4.5V] [5.0V] [5.5V] [6.0V]

## Fan Auto Mode Start Temp [30ºC]

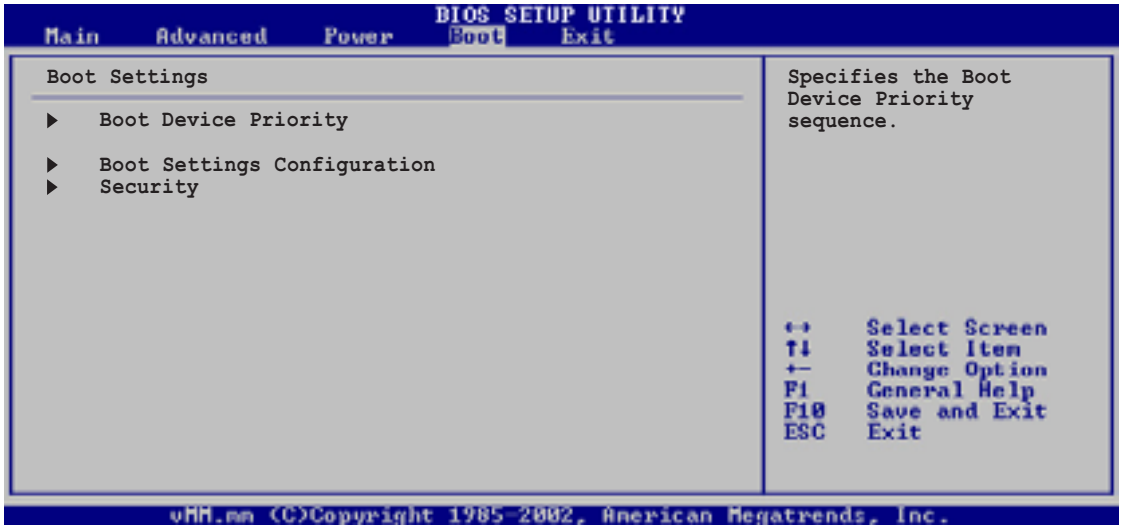
Select the temperature for the auto start fan feature. The fan starts when the system reaches the specified temperature.
Configuration options: [25ºC]...[75ºC]

## Fan Auto Mode Full Speed Temp [70ºC]

Select the temperature for the fan to rotate in full speed. The fan switches to full speed when the system reaches the specified temperature.
Configuration options: [25ºC]...[75ºC]

# 5.6 Boot menu

The Boot menu items allow you to change the system boot options. Select an item then press Enter to display the sub-menu.




## 5.6.1 Boot Device Priority

BIOS SETUP UTILITY
Boot
Boot Device Priority
1st Boot Device [First Floppy Drive]
2nd Boot Device [PM-ST320413A]
3rd Boot Device [PS-ASUS CD-S340]
Specifies the boot sequence from the available devices.
A device enclosed in parenthesis has been disabled in the corresponding type menu.
↔ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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### 1st ~ xxth Boot Device

These items specify the boot device priority sequence from the available devices. The number of device items that appear on the screen depends on the the number of devices installed in your system.
Configuration options: [xxxxx Drive] [Disabled]

## 5.6.2 Boot Settings Configuration

BIOS SETUP UTILITY
Boot
Boot Settings Configuration
Quick Boot [Enabled]
Full Screen Logo [Enabled]
Add On ROM Display Mode [Force BIOS]
Bootup Num-Lock [On]
Wait for 'F1' If Error [Enabled]
Hit 'DEL' Message Display [Enabled]
Interrupt 19 Capture [Disabled]
Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
↔ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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### Quick Boot [Enabled]

Enabling this item allows the BIOS to skip some power on self tests (POST) while booting to decrease the time needed to boot the system. When set to [Disabled], BIOS performs all the POST items.
Configuration options: [Enabled] [Disabled]

### Full Screen Logo [Enabled]

This allows you to enable or disable the full screen logo display feature.
Configuration options: [Enabled] [Disabled]

Make sure that the Full Screen Logo item is set to [Enabled] if you wish to use the ASUS MyLogo2™ feature.

### Add On ROM Display Mode [Force BIOS]

Sets the display mode for option ROM.
Configuration options: [Force BIOS] [Keep Current]

### Bootup Num-Lock [On]

Allows you to select the power-on state for the NumLock.
Configuration options: [On] [Off]

### Wait for 'F1' If Error [Enabled]

When set to Enabled, the system waits for F1 key to be pressed when error occurs. Configuration options: [Enabled] [Disabled]

### Hit 'DEL' Message Display [Enabled]

When set to Enabled, the system displays the message "Press DEL to run Setup" during POST. Configuration options: [Enabled] [Disabled]

### Interrupt 19 Capture [Disabled]

When set to [Enabled], this function allows the option ROMs to trap Interrupt 19. Configuration options: [Disabled] [Enabled]

## 5.6.3 Security

The Security menu items allow you to change the system security settings. Select an item then press Enter to display the configuration options.

### Change Supervisor Password

Select this item to set or change the supervisor password. The Supervisor Password item on top of the screen shows the default **Not Installed**. After you have set a password, this item shows **Installed**.

To set a **Supervisor Password**:

1. Select the Change Supervisor Password item and press Enter.
2. On the password box that appears, type a password composed of letters and/or numbers, then press Enter. Your password should have at least six characters.
3. Confirm the password when prompted.

The message "**Password Installed**" appears after you have successfully set your password.

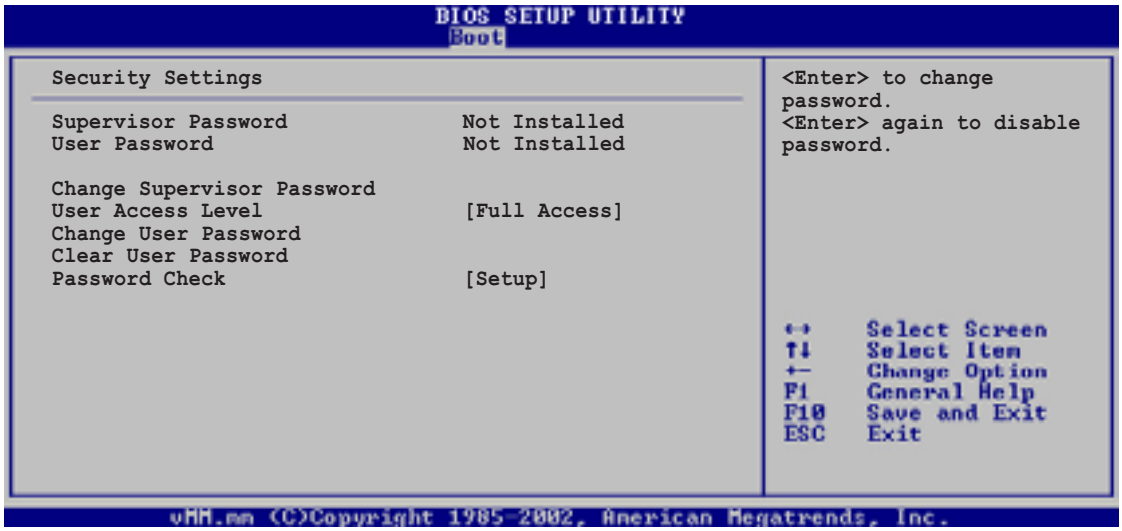
The Supervisor Password item now shows **Installed**.

To change the supervisor password, follow the same steps as in setting a user password.

To clear the supervisor password, select the Change Supervisor Password then press Enter. The message "**Password Uninstalled**" appears.

If you forget your BIOS password, you can clear clear it by erasing the CMOS Real Time Clock (RTC) RAM. See section 4.3 “Jumper” for information on how to erase the RTC RAM.

After you have set a supervisor password, the other items appear to allow you to change other security settings.




## User Access Level (Full Access]

This item allows you to select the access restriction to the Setup items. Configuration options: [No Access] [View Only] [Limited] [Full Access]

**No Access** prevents user access to the Setup utility.

**View Only** allows access but does not allow change to any field.

**Limited** allows change to only selected fields, such as Date and Time.

**Full Access** allows viewing and changing all the fields in the Setup utility.

## Change User Password

Select this item to set or change the user password. The User Password item on top of the screen shows the default **Not Installed**. After you have set a password, this item shows **Installed**.

To set a **User Password**:

1. Select the Change User Password item and press Enter.
2. On the password box that appears, type a password composed of letters and/or numbers, then press Enter. Your password should have at least six characters.
3. Confirm the password when prompted.

The message “**Password Installed**” appears after you have successfully set your password.

The User Password item now shows **Installed**.

To change the user password, follow the same steps as in setting a user password

## Clear User Password

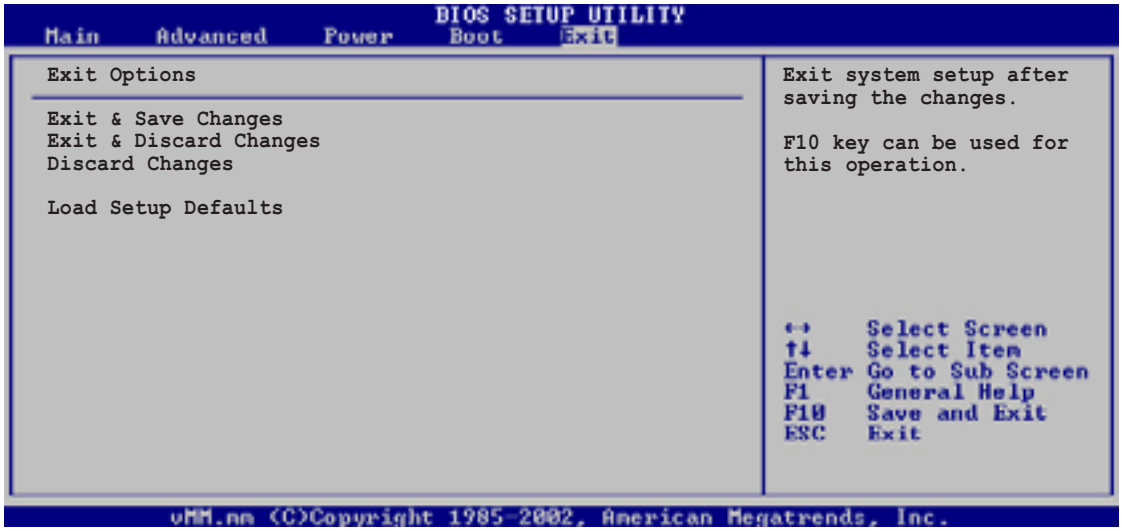
Select this item if you wish to clear the user password.

## Password Check [Setup]

When set to [Setup], BIOS checks for user password when accessing the Setup utility. When set to [Always], BIOS checks for user password both when accessing Setup and booting the system.
Configuration options: [Setup] [Always]

# 5.7 Exit menu

The Exit menu items allow you to load the optimal or failsafe default values for the BIOS items, and save or discard your changes to the BIOS items.


BIOS SETUP UTILITY
Main Advanced Power Boot Exit
Exit Options
Exit & Save Changes
Exit & Discard Changes
Discard Changes
Load Setup Defaults
Exit system setup after saving the changes.
F10 key can be used for this operation.
↔ Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
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Pressing <Esc> does not immediately exit this menu. Select one of the options from this menu or <F10> from the legend bar to exit.

## Exit & Save Changes

Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved to the CMOS RAM. The CMOS RAM is sustained by an onboard backup battery and stays on even when the PC is turned off. When you select this option, a confirmation window appears. Select [Yes] to save changes and exit.

If you attempt to exit the Setup program without saving your changes, the program prompts you with a message asking if you want to save your changes before exiting. Pressing <Enter> saves the changes while exiting.

## Exit & Discard Changes

Select this option only if you do not want to save the changes that you made to the Setup program. If you made changes to fields other than system date, system time, and password, the BIOS asks for a confirmation before exiting.

## Discard Changes

This option allows you to discard the selections you made and restore the previously saved values. After selecting this option, a confirmation appears. Select [Yes] to discard any changes and load the previously saved values.

## Load Setup Defaults

This option allows you to load the default values for each of the parameters on the Setup menus. When you select this option or if you press <F5>, a confirmation window appears. Select [Yes] to load the default values. Select **Exit Saving Changes** or make other changes before saving the values to the non-volatile RAM.